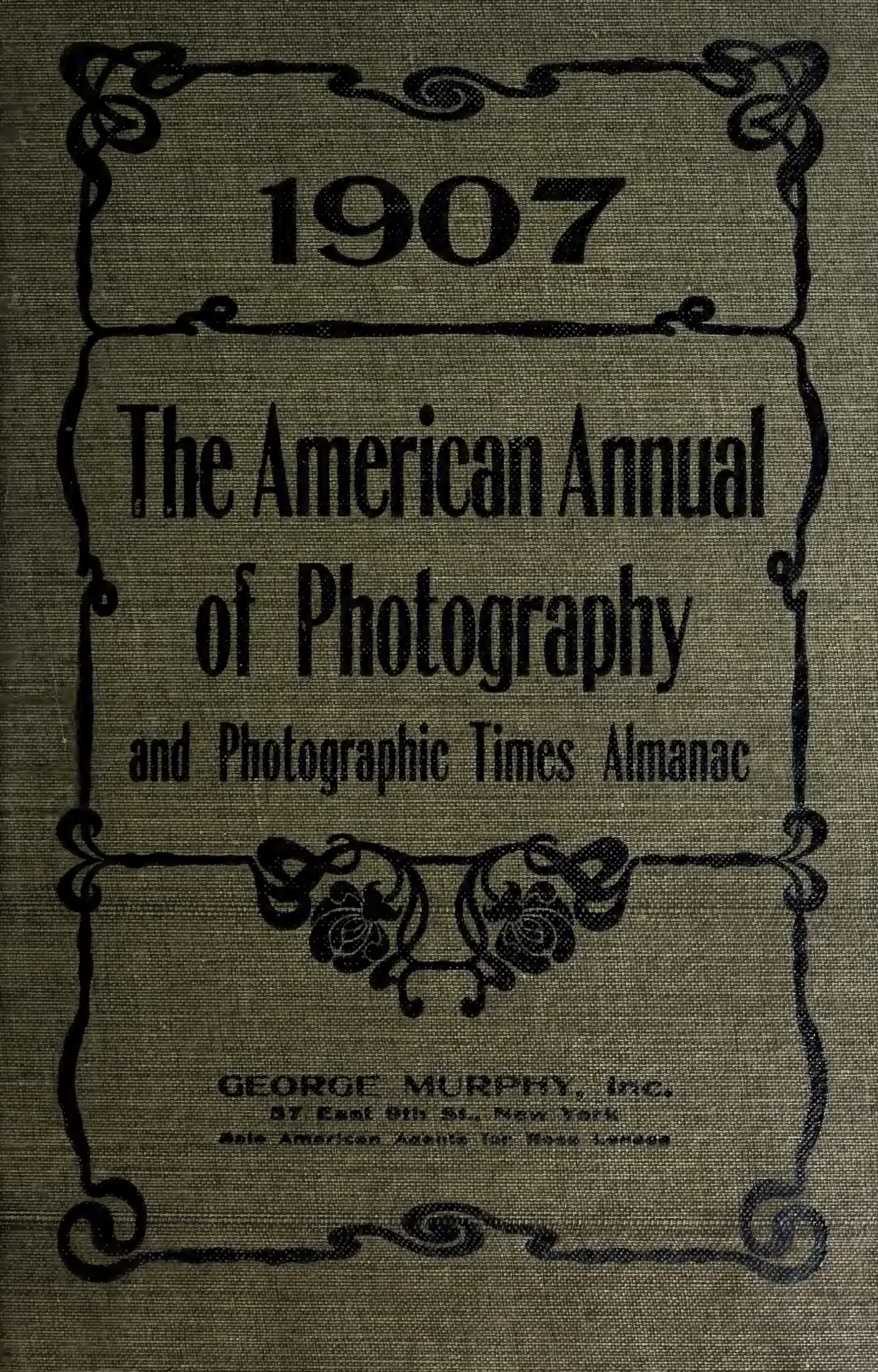

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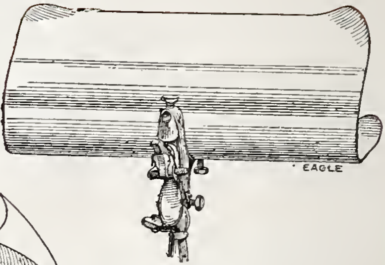

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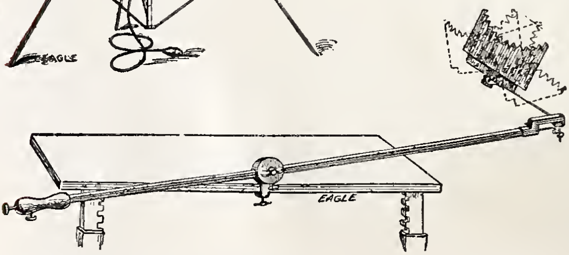

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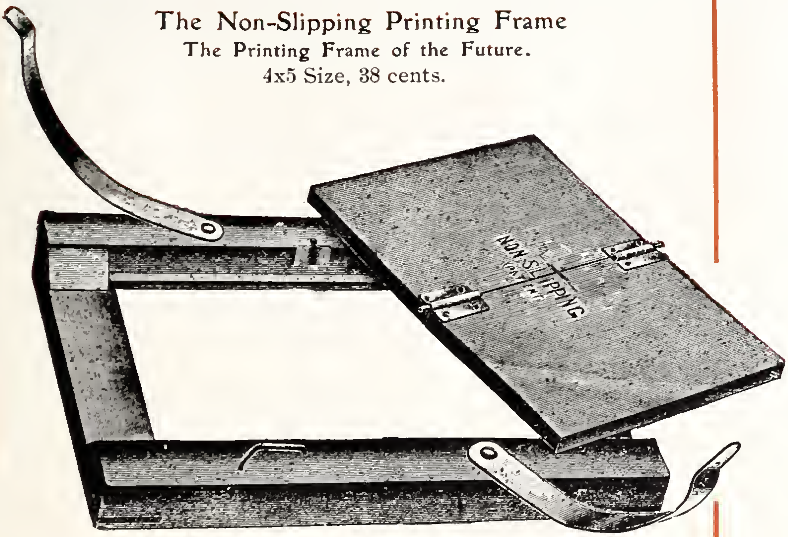

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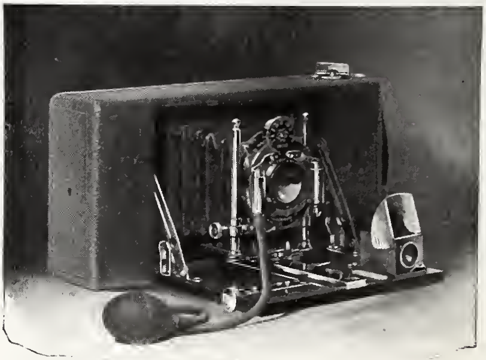

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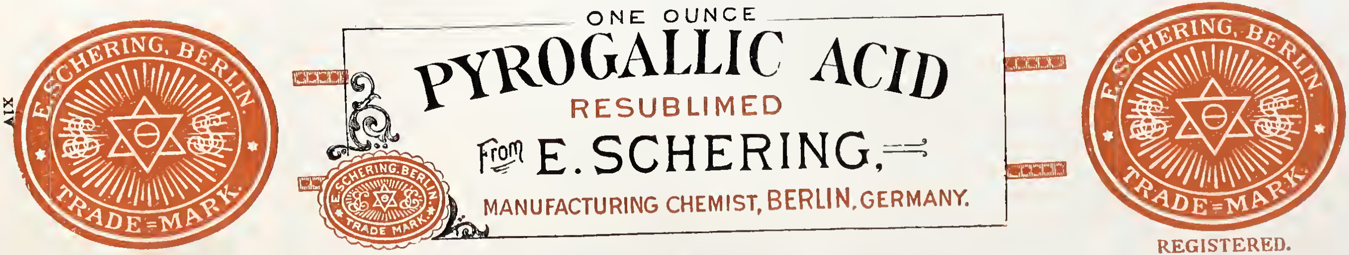

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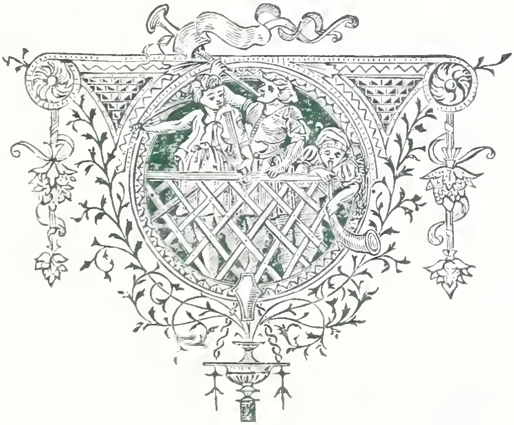

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PREFACE

THE AMERICAN ANNUAL OF PHOTOGRAPHY this year attains its majority and is old enough to vote, as this is the twenty-first volume of the book. In presenting it to the public we wish to express our cordial appreciation of the generous manner in which our contributors have co-operated with us in preparing this volume. It is to the intelligent efforts of our talented contributors that our readers are most largely indebted for the interest and value of this volume; and it is therefore to the authors of the articles and the makers of the pictures, that we extend, in this way, the thanks of both readers and publishers, together with our own.

THE EDITOR.

New York, November, 1906.

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Wesel, F. Manufacturing Co xxx

January, 1907.

1st Month. 31 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City. Sun rises. H. M.	N. Y. City. Sun sets. H. M.
1	**1**	Tu	7 25	4 43
2	**2**	W	7 25	4 44
3	**3**	Th	7 25	4 45
4	**4**	F	7 25	4 46
5	**5**	Sa	7 25	4 47
6	**6**	S	7 25	4 48
7	**7**	M	7 25	4 49
8	**8**	Tu	7 24	4 50
9	**9**	W	7 24	4 51
10	**10**	Th	7 24	4 52
11	**11**	F	7 24	4 53
12	**12**	Sa	7 23	4 54
13	**13**	S	7 23	4 55
14	**14**	M	7 23	4 56
15	**15**	Tu	7 22	4 57
16	**16**	W	7 22	4 59
17	**17**	Th	7 21	5 00
18	**18**	F	7 21	5 01
19	**19**	Sa	7 21	5 02
20	**20**	S	7 20	5 03
21	**21**	M	7 19	5 04
22	**22**	Tu	7 18	5 05
23	**23**	W	7 17	5 07
24	**24**	Th	7 17	5 08
25	**25**	F	7 16	5 09
26	**26**	Sa	7 16	5 10
27	**27**	S	7 15	5 11
28	**28**	M	7 14	5 13
29	**29**	Tu	7 13	5 14
30	**30**	W	7 12	5 15
31	**31**	Th	7 12	5 16

February, 1907.

2d Month. 28 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City. Sun rises. H. M.	N. Y. City. Sun sets. H. M
32	**1**	F	7 11	5 18
33	**2**	Sa	7 10	5 19
34	**3**	S	7 09	5 20
35	**4**	M	7 07	5 21
36	**5**	Tu	7 06	5 22
37	**6**	W	7 05	5 23
38	**7**	Th	7 04	5 25
39	**8**	F	7 03	5 26
40	**9**	Sa	7 02	5 27
41	**10**	S	7 01	5 28
42	**11**	M	7 00	5 30
43	**12**	Tu	6 58	5 31
44	**13**	W	6 57	5 32
45	**14**	Th	6 56	5 34
46	**15**	F	6 55	5 35
47	**16**	Sa	6 53	5 36
48	**17**	S	6 52	5 37
49	**18**	M	6 51	5 39
50	**19**	Tu	6 49	5 40
51	**20**	W	6 48	5 41
52	**21**	Th	6 46	5 43
53	**22**	F	6 45	5 44
54	**23**	Sa	6 44	5 45
55	**24**	S	6 42	5 46
56	**25**	M	6 41	5 48
57	**26**	Tu	6 39	5 49
58	**27**	W	6 38	5 50
59	**28**	Th	6 37	5 51

March, 1907.

3d Month. 31 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City.	
			Sun rises.	Sun sets
			H. M.	H. M.
60	**1**	F	6 35	5 53
61	**2**	Sa	6 34	5 53
62	**3**	𝔖	6 32	5 54
63	**4**	M	6 30	5 55
64	**5**	Tu	6 29	5 56
65	**6**	W	6 27	5 57
66	**7**	Th	6 25	5 58
67	**8**	F	6 24	5 59
68	**9**	Sa	6 22	6 00
69	**10**	𝔖	6 20	6 01
70	**11**	M	6 19	6 02
71	**12**	Tu	6 17	6 03
72	**13**	W	6 16	6 04
73	**14**	Th	6 14	6 05
74	**15**	F	6 12	6 06
75	**16**	Sa	6 11	6 08
76	**17**	𝔖	6 09	6 09
77	**18**	M	6 07	6 10
78	**19**	Tu	6 06	6 11
79	**20**	W	6 04	6 12
80	**21**	Th	6 02	6 13
81	**22**	F	6 01	6 14
82	**23**	Sa	5 59	6 15
83	**24**	𝔖	5 58	6 16
84	**25**	M	5 56	6 17
85	**26**	Tu	5 54	6 18
86	**27**	W	5 52	6 19
87	**28**	Th	5 51	6 20
88	**29**	F	5 49	6 21
89	**30**	Sa	5 47	6 22
90	**31**	𝔖	5 45	6 23

April, 1907.

4th Month. 30 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City.	
			Sun rises.	Sun sets.
			H. M	H. M
91	**1**	M	5 44	6 24
92	**2**	Tu	5 42	6 26
93	**3**	W	5 41	6 27
94	**4**	Th	5 39	6 28
95	**5**	F	5 37	6 29
96	**6**	Sa	5 36	6 30
97	**7**	𝔖	5 34	6 31
98	**8**	M	5 33	6 32
99	**9**	Tu	5 31	6 33
100	**10**	W	5 30	6 34
101	**11**	Th	5 28	6 35
102	**12**	F	5 26	6 36
103	**13**	Sa	5 25	6 37
104	**14**	𝔖	5 24	6 38
105	**15**	M	5 22	6 39
106	**16**	Tu	5 20	6 40
107	**17**	W	5 19	6 41
108	**18**	Th	5 17	6 42
109	**19**	F	5 16	6 43
110	**20**	Sa	5 14	6 44
111	**21**	𝔖	5 13	6 45
112	**22**	M	5 11	6 46
113	**23**	Tu	5 10	6 47
114	**24**	W	5 08	6 48
115	**25**	Th	5 07	6 49
116	**26**	F	5 06	6 50
117	**27**	Sa	5 04	6 51
118	**28**	𝔖	5 03	6 52
119	**29**	M	5 02	6 53
120	**30**	Tu	5 00	6 55

May, 1907.

5th Month. 31 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City.	
			Sun rises.	Sun sets.
			H. M.	H. M.
121	1	W	4 59	6 56
122	2	Th	4 58	6 57
123	3	F	4 56	6 58
124	4	Sa	4 55	6 59
125	5	𝔖	4 54	7 00
126	6	M	4 53	7 01
127	7	Tu	4 52	7 02
128	8	W	4 51	7 03
129	9	Th	4 49	7 04
130	10	F	4 48	7 05
131	11	Sa	4 47	7 06
132	12	𝔖	4 46	7 07
133	13	M	4 45	7 08
134	14	Tu	4 44	7 09
135	15	W	4 43	7 10
136	16	Th	4 42	7 11
137	17	F	4 41	7 12
138	18	Sa	4 40	7 13
139	19	𝔖	4 39	7 14
140	20	M	4 39	7 15
141	21	Tu	4 38	7 16
142	22	W	4 37	7 17
143	23	Th	4 36	7 18
144	24	F	4 36	7 19
145	25	Sa	4 35	7 20
146	26	𝔖	4 34	7 20
147	27	M	4 34	7 21
148	28	Tu	4 33	7 22
149	29	W	4 32	7 23
150	30	Th	4 32	7 23
151	31	F	4 31	7 24

June, 1907.

6th Month. 30 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City.	
			Sun rises.	Sun sets.
			H. M.	H. M.
152	1	Sa	4 31	7 24
153	2	𝔖	4 30	7 25
154	3	M	4 30	7 26
155	4	Tu	4 30	7 26
156	5	W	4 29	7 27
157	6	Th	4 29	7 28
158	7	F	4 29	7 28
159	8	Sa	4 29	7 29
160	9	𝔖	4 28	7 30
161	10	M	4 28	7 30
162	11	Tu	4 28	7 31
163	12	W	4 28	7 31
164	13	Th	4 28	7 32
165	14	F	4 28	7 32
166	15	Sa	4 28	7 32
167	16	𝔖	4 28	7 33
168	17	M	4 28	7 33
169	18	Tu	4 28	7 33
170	19	W	4 28	7 34
171	20	Th	4 29	7 34
172	21	F	4 29	7 34
173	22	Sa	4 29	7 34
174	23	𝔖	4 29	7 34
175	24	M	4 29	7 34
176	25	Tu	4 30	7 35
177	26	W	4 30	7 35
178	27	Th	4 30	7 35
179	28	F	4 31	7 35
180	29	Sa	4 31	7 35
181	30	𝔖	4 32	7 35

July, 1907.

7th Month. 31 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City.	
			Sun rises.	Sun sets
			H. M	H. M.
182	**1**	M	4 32	7 35
183	**2**	Tu	4 32	7 35
184	**3**	W	4 33	7 34
185	**4**	Th	4 33	7 34
186	**5**	F	4 34	7 34
187	**6**	Sa	4 35	7 34
188	**7**	$	4 35	7 33
189	**8**	M	4 36	7 33
190	**9**	Tu	4 37	7 33
191	**10**	W	4 37	7 32
192	**11**	Th	4 38	7 32
193	**12**	F	4 39	7 31
194	**13**	Sa	4 39	7 31
195	**14**	$	4 40	7 30
196	**15**	M	4 41	7 30
197	**16**	Tu	4 42	7 29
198	**17**	W	4 43	7 29
199	**18**	Th	4 44	7 28
200	**19**	F	4 44	7 27
201	**20**	Sa	4 45	7 26
202	**21**	$	4 46	7 26
203	**22**	M	4 47	7 25
204	**23**	Tu	4 48	7 24
205	**24**	W	4 48	7 23
206	**25**	Th	4 49	7 23
207	**26**	F	4 50	7 22
208	**27**	Sa	4 51	7 21
209	**28**	$	4 52	7 20
210	**29**	M	4 53	7 19
211	**30**	Tu	4 54	7 18
212	**31**	W	4 55	7 17

August, 1907.

8th Month. 31 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City.	
			Sun rises.	Sun sets.
			H. M.	H. M
213	**1**	Th	4 56	7 16
214	**2**	F	4 57	7 14
215	**3**	Sa	4 58	7 13
216	**4**	$	4 59	7 12
217	**5**	M	5 00	7 11
218	**6**	Tu	5 01	7 10
219	**7**	W	5 02	7 09
220	**8**	Th	5 03	7 07
221	**9**	F	5 04	7 06
222	**10**	Sa	5 05	7 05
223	**11**	$	5 06	7 04
224	**12**	M	5 07	7 02
225	**13**	Tu	5 08	7 01
226	**14**	W	5 09	7 00
227	**15**	Th	5 10	6 58
228	**16**	F	5 11	6 57
229	**17**	Sa	5 12	6 55
230	**18**	$	5 13	6 54
231	**19**	M	5 14	6 53
232	**20**	Tu	5 15	6 51
233	**21**	W	5 16	6 50
234	**22**	Th	5 17	6 48
235	**23**	F	5 17	6 47
236	**24**	Sa	5 18	6 45
387	**25**	$	5 19	6 44
238	**26**	M	5 20	6 42
239	**27**	Tu	5 21	6 41
240	**28**	W	5 22	6 39
241	**29**	Th	5 23	6 37
242	**30**	F	5 24	6 36
243	**31**	Sa	5 25	6 34

September, 1907.

9th Month. 30 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City.	
			Sun rises. H. M.	Sun sets. H. M.
244	**1**	𝔖	5 26	6 33
245	**2**	M	5 27	6 31
246	**3**	Tu	5 28	6 29
247	**4**	W	5 29	6 28
248	**5**	Th	5 30	6 26
249	**6**	F	5 31	6 25
250	**7**	Sa	5 32	6 23
251	**8**	𝔖	5 33	6 21
252	**9**	M	5 34	6 20
253	**10**	Tu	5 35	6 18
254	**11**	W	5 36	6 16
255	**12**	Th	5 37	6 15
256	**13**	F	5 38	6 13
257	**14**	Sa	5 39	6 11
258	**15**	𝔖	5 40	6 09
259	**16**	M	5 41	6 08
260	**17**	Tu	5 42	6 06
261	**18**	W	5 43	6 04
262	**19**	Th	5 44	6 03
263	**20**	F	5 45	6 01
264	**21**	Sa	5 46	5 59
265	**22**	𝔖	5 47	5 58
266	**23**	M	5 48	5 56
267	**24**	Tu	5 49	5 55
268	**25**	W	5 50	5 53
269	**26**	Th	5 51	5 52
270	**27**	F	5 52	5 50
271	**28**	Sa	5 53	5 48
272	**29**	𝔖	5 54	5 46
273	**30**	M	5 54	5 44

October, 1907.

10th Month. 31 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City.	
			Sun rises. H. M	Sun sets. H. M
274	**1**	Tu	5 56	5 43
275	**2**	W	5 57	5 41
276	**3**	Th	5 58	5 39
277	**4**	F	5 59	5 38
278	**5**	Sa	6 00	5 36
279	**6**	𝔖	6 01	5 35
280	**7**	M	6 02	5 33
281	**8**	Tu	6 03	5 31
282	**9**	W	6 04	5 30
283	**10**	Th	6 05	5 28
284	**11**	F	6 07	5 27
285	**12**	Sa	6 08	5 25
286	**13**	𝔖	6 09	5 23
287	**14**	M	6 10	5 22
288	**15**	Tu	6 11	5 20
289	**16**	W	6 12	5 19
290	**17**	Th	6 13	5 17
291	**18**	F	6 14	5 16
292	**19**	Sa	6 15	5 14
293	**20**	𝔖	6 16	5 13
294	**21**	M	6 18	5 12
295	**22**	Tu	6 19	5 10
296	**23**	W	6 20	5 09
397	**24**	Th	6 21	5 07
298	**25**	F	6 22	5 06
299	**26**	Sa	6 23	5 04
300	**27**	𝔖	6 24	5 03
301	**28**	M	6 26	5 02
302	**29**	Tu	6 27	5 01
303	**30**	W	6 28	4 59
304	**31**	Th	6 29	4 58

November, 1907.

11th Month. 30 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City.	
			Sun rises.	Sun sets.
			H. M.	H. M.
305	**1**	F	6 30	4 57
306	**2**	Sa	6 31	4 56
307	**3**	𝔖	6 32	4 54
308	**4**	M	6 34	4 53
309	**5**	Tu	6 35	4 52
310	**6**	W	6 36	4 51
311	**7**	Th	6 37	4 50
312	**8**	F	6 38	4 49
313	**9**	Sa	6 40	4 48
314	**10**	𝔖	6 41	4 47
315	**11**	M	6 42	4 46
316	**12**	Tu	6 43	4 45
317	**13**	W	6 44	4 44
318	**14**	Th	6 46	4 43
319	**15**	F	6 47	4 42
320	**16**	Sa	6 48	4 41
321	**17**	𝔖	6 49	4 40
322	**18**	M	6 50	4 39
323	**19**	Tu	6 51	4 39
324	**20**	W	6 53	4 38
325	**21**	Th	6 54	4 38
326	**22**	F	6 55	4 37
327	**23**	Sa	6 56	4 36
328	**24**	𝔖	6 57	4 36
329	**25**	M	6 58	4 35
330	**26**	Tu	6 59	4 35
331	**27**	W	7 00	4 35
332	**28**	Th	7 02	4 34
333	**29**	F	7 03	4 34
334	**30**	Sa	7 04	4 34

December, 1907.

12th Month. 31 Days.

Day of Year.	Day of Month.	Day of Week.	N. Y. City.	
			Sun rises.	Sun sets.
			H. M.	H. M
335	**1**	𝔖	7 05	4 34
336	**2**	M	7 06	4 33
337	**3**	Tu	7 07	4 33
338	**4**	W	7 08	4 33
339	**5**	Th	7 09	4 32
340	**6**	F	7 10	4 32
341	**7**	Sa	7 11	4 32
342	**8**	𝔖	7 12	4 32
343	**9**	M	7 13	4 32
344	**10**	Tu	7 14	4 32
345	**11**	W	7 15	4 32
346	**12**	Th	7 15	4 32
347	**13**	F	7 16	4 33
348	**14**	Sa	7 16	4 33
349	**15**	𝔖	7 17	4 33
350	**16**	M	7 18	4 33
351	**17**	Tu	7 18	4 33
352	**18**	W	7 19	4 34
353	**19**	Th	7 20	4 34
354	**20**	F	7 20	4 35
355	**21**	Sa	7 21	4 35
356	**22**	𝔖	7 21	4 36
357	**23**	M	7 22	4 37
358	**24**	Tu	7 22	4 37
359	**25**	W	7 23	4 38
360	**26**	Th	7 23	4 39
361	**27**	F	7 23	4 39
362	**28**	Sa	7 23	4 40
363	**29**	𝔖	7 24	4 40
364	**30**	M	7 24	4 41
365	**31**	Tu	7 24	4 42

1906

	S	M	T	W	T	F	S
Jan.	..	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31	..	..	..
Feb.	..	..	..	..	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	..	..	..
Mar.	..	..	..	..	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
	..	..	..	..	..	..	..
April	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	..	..	..	..	..

	S	M	T	W	T	F	S
May	..	..	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31	..	..
June	..	..	..	..	..	1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	..	..		..	..	..	..
July	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31	..	..	..	..
Aug.	..	..	..	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	..

	S	M	T	W	T	F	S
Sept.	..	..	..	..	..	..	1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	..	..	..	..	..	..
Oct.	..	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31	..	..	..
Nov.	..	..	..	..	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	..
Dec.	..	..	..	..	..	..	1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31	..	..	..	..	..

1907

	S	M	T	W	T	F	S
Jan.	..	..	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31	..	..
Feb.	..	..	..	..	..	1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	..	..
Mar.	..	..	..	..	..	1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
	31	..	..	..	..	..	..
April	..	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	..	..	..	..

	S	M	T	W	T	F	S
May	..	..	..	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	..
June	..	..	..	..	..	..	1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	..	..	..	..	..	..
July	..	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	31	..	..	..
Aug.	..	..	..	..	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31

	S	M	T	W	T	F	S
Sept.	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	..	..	..	..	..
Oct.	..	..	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31	..	..
	..	..	..	..	..	1	2
Nov.	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
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Dec.	1	2	3	4	5	6	7
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	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31	..	..	..	..

1908

	S	M	T	W	T	F	S
Jan.	..	..	..	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	..
Feb.	..	..	..	..	..	..	1
	2	3	4	5	6	7	8
	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
Mar.	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31	..	..	..	..
April	..	..	..	1	2	3	4
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	S	M	T	W	T	F	S
May	..	..	..	..	..	1	2
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	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	52	26	27	28	29	30
	31	..	..	..	..	..	..
June	..	1	2	3	4	5	6
	7	8	9	10	11	12	13
	14	15	16	17	18	19	20
	21	22	23	24	25	26	27
	28	29	30	..	..	..	..
July	..	..	..	1	2	3	4
	5	6	7	8	9	10	11
	12	13	14	15	16	17	18
	19	20	21	22	23	24	25
	26	27	28	29	30	31	..
Aug.	..	..	..	..	..	..	1
	2	3	4	5	6	7	8
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	30	31	..	..	..	..	..

	S	M	T	W	T	F	S
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	20	21	22	23	24	25	26
	27	28	29	30	..	..	..
Oct.	..	..	..	..	1	2	3
	4	5	6	7	8	9	10
	11	12	13	14	15	16	17
	18	19	20	21	22	23	24
	25	26	27	28	29	30	31
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Nov.	1	2	3	4	5	6	7
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	22	23	24	25	26	27	28
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Dec.	..	..	1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31	..	..
	..	..	..	..	..	..	..

Eclipses in 1907.

Note—*Local mean time for the latitude of New York City is used in reckoning eclipses, sunset and sunrise. Subtract four minutes to change the reckoning to Eastern standard time of the 75th meridian.*

Moon's phases are calculated for Eastern standard time. "Morn," is understood to extend from Midnight to Noon; "Eve," from Noon to Midnight.

In the year 1907 there will be four Eclipses, two of the Sun and two of the Moon, and a Transit of Mercury, as follows:

I. Total of the Sun, January 14, invisible in the United States.

II. Partial of the Moon, January 29. The moon will set before the end of the eclipse in eastern United States. The beginning (Penumbra) will be visible generally in the United States at 5.46 A. M.

III. Annular of the Sun, July 10, invisible in the United States.

IV. Partial of the Moon, July 24-25, visible in United States. Begins, (Umbra), 10.4 P. M., 24th; ends 0.40 A. M., 25th. Size, 7.44 digits on the northern limb.

Transit of the planet Mercury across the sun's disk from west to east, November 14th. Begins at 5.18 A. M.; ends at 8.39 A. M. Look near the northern limb of the sun, using smoked or colored glass to protect the eyes.

The Seasons.

SPRING begins	March 20, 3 p. m.	AUTUMN begins	September 23, 2 a. m.
SUMMER begins	June 21, noon.	WINTER begins	December 21, 9 p. m.

Church Days.

Epiphany	Jan. 6	Good Friday	Mar. 29
Septuagesima Sun.	Jan. 27	Easter Sunday	Mar. 31
Sexagesima Sun.	Feb. 3	Low Sunday	Apr. 7
Quinquagesima Sun	Feb. 10	Rogation Sunday	May 5
Shrove Tuesday	Feb. 12	Ascension Day	May 9
Ash-Wednesday	Feb. 13	Whitsunday (Pent.)	May 19
Quadragesima Sun.	Feb. 17	Trinity Sunday	May 26
Mid-Lent Sun.	Mar. 10	Corpus Christi	May 30
Palm Sun	Mar. 24	Advent Sunday	Dec. 1

Chronological Cycles.

Dominical Letter	F
Epact	16
Lunar Cycle (Gold. No.)	8
Solar Cycle	12
Roman Indiction	5
Julian Period	6620
Dionysian Period	236
Jewish Lunar Cycle	5

Chronological Eras.

The year 1907, which comprises the latter part of the 131st and the first part of the 132nd year of the Independence of the United States of America, corresponds to the year 6620 of Julian Period, the year 7415-7416 of the Byzantine Era; the year 56 7-68 of the Jewish Era; the year 2660 since the Foundation of Rome, according to Varro; the year 2683 of the Olympiads; the year 1623 of the era of Diocletian; the year 2567 of the Japanese Era; the year 1324-25 of the Mohammedan Era.

The first day of January of the year 1907 is the 2,417,213th day since the commencement of the Julian Period.

The Julian Calendar, which is still used in the Russian Empire, dates twelve days back of our own—the Gregorian Calender. Thus a letter from St. Petersburg dated January 1st was really written on January 13th.

The Russians generally use, in official documents and frequently in business correspondence, two dates, which they call "old style" and "new style"; and in Alaska three dates have been used on their documents, because the early navigators forgot to make allowance for the crossing of the 180th meridian in sailing from Siberia to North America.

Legal Holidays in the Various States.

Jan. 1. New Year's Day. In all States except Massachusetts, New Hampshire and Rhode Island.

Jan. 8 Anniversary of the Battle of New Orleans: In Louisiana.

Jan. 19. Lee's Birthday: In Georgia, North Carolina and Virginia.

Feb. 12. Lincoln's Birthday: In all States.

Feb. 22. Washington's Birthday: In all States except Arkansas, Iowa and Mississippi.

Feb. 19. Mardi-Gras: In Alabama and Louisiana

March 2. Anniversary of Texan Independence: In Texas.

March 4. Firemen's Anniversady: In New Orleans, La.

April 1. Good Friday: In Alabama, Louisiana, Maryland, Pennsylvania and Tennessee.

April 19. Patriots' Day: In Massachusetts.

April 21. Anniversary of the Battle of San Jacinto: In Texas.

April 26: Memorial Day: In Alabama and Georgia.

May 4. Charter Day: In New York.

May 10. Memorial Day: In North Carolina.

May 20. Anniversary of the Signing of the Mecklenburg Declaration of Independence: In North Carolina.

May 30. Decoration Day: In Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Iowa, Illinois, Indiana, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oklahoma, Oregan, Pennsylvania, Rhode Island, Tennessee, Utah, Vermont, Wisconsin, Washington and Wyoming.

June 3. Jefferson Davis's Birthday: In Florida.

June 17. Battle of Bunker Hill; In Boston, Mass.

July 4. Independence Day; In all States.

July 24. Pioneer's Day: In Utah.

Sept. 3. Labor Day; In Alabama, California, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Maine, Maryland. Massachusetts, Michigan, Montana, Nebraska, New Hampshire, New Jersey, New York,

Legal Holidays (Continued).

Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia and Washington.

Sept. 9. Admission Day: In California.

Sept. 12. Labor Day: In Florida.

Oct. 31. Admission Day: In Nevada.

Nov. 8. General Election Day: In Arizona, California, Idaho, Indiana, Kansas, Maryland, Minnesota, Missouri. Montana, Nevada, New Hampshire, New Jersey, New York, North Dakota, Ohio. Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, West Virginia, Washington, Wisconsin and Wyoming.

Nov. 25. Labor Day: In Louisiana.

Nov. 29. Thanksgiving Day · In all States, though in some it is not a statutory holiday.

Dec. 25. Christmas Day: In all States, in South Carolina; the two succeeding days in addition.

Sundays and Fast Days are legal holidays in all States, which designate them as such.

Arbor Day is a legal holiday in Kansas, North Dakota, Rhode Island and Wyoming, the day being set by the Governor—in Nebraska, April 23, California, September 9, Colorada, third Friday in April; Montana. third Tuesday in April; Utah, first Saturday in April; Idaho, Friday after May 1st.

Every Saturday after 12 o'clock noon is a legal holiday in New York, New Jersey, New Orleans, Pennsylvania and Maryland; and from June 1 to September 30 New Castle Co., Del.

There are no national holidays, not even the Fourth of July. Congress has at various times appointed special holidays. In the second session of the Fifty-third Congress, it passed an act making Labor Day a public holiday in the District of Columbia; and it has recognized the existence of certain days as holidays, for commercial purposes, in such legislation as the Bankruptcy act, but with the exception named, there is no general statute on the subject. The proclamation of the President designating a day of thanksgiving only, makes it a holiday in those States which provide by law for it.

United States and Territories.

States and Territories.	Populat'n in 1900.	Capitals.	States and Territories.	Populat'n in 1900.	Capitals.
Alabama	1,828,697	Montgomery.	Montana........	243,329	Helena.
Alaska Terr......	63,441	Sitka.	Nebraska	1,068,539	Lincoln.
Arizona	122,931	Phœnix.	Nevada	42,335	Carson City.
Arkansas	1,311,564	Little Rock.	New Hampshire.	411,588	Concord.
California........	1,485,053	Sacramento.	New Jersey	1,883,669	Trenton.
Colorado	539,700	Denver.	New Mexico T..	195,310	Santa Fé.
Connecticut......	908,355	Hartford.	New York	7,268,012	Albany.
Delaware........	184,735	Dover.	North Carolina..	1,893,810	Raleigh.
Florida	528,542	Tallahassee.	North Dakota...	319,146	Bismark.
Georgia..........	2,216,331	Atlanta.	Ohio...........	4,157,545	Columbus.
Idaho............	161,772	Boise City.	Oklahoma Terr..	398,245	Guthrie.
Illinois...........	4,821,550	Springfield.	Oregon	413,536	Salem.
Indiana	2,516,462	Indianapolis.	Pennsylvania ...	6,302,115	Harrisburg.
Indian Terr......	391,960		Rhode Island...	428,556	Providence.
Iowa.............	2,231,853	Des Moines	South Carolina..	1,340,316	Columbia.
Kansas...........	1,470,495	Topeka.	South Dakota...	401,570	Pierre.
Kentucky........	2,147,174	Frankfort.	Tennessee	2,020,616	Nashville.
Louisiana........	1,381,625	Baton Rouge.	Texas...........	3.048,710	Austin.
Maine...........	694,466	Augusta.	Utah	276,749	Salt Lake City.
Maryland........	1,190,050	Annapolis.	Vermont	343,641	Montpelier.
Massachusetts....	2,805,346	Boston.	Virginia	1,854,184	Richmond.
Michagan........	2,420,982	Lansing.	Washington.....	518,103	Olympia.
Minnesota	1,751,394	St. Paul.	West Virginia...	958,100	Charleston.
Mississippi.......	1,551,270	Jackson.	Wisconsin.......	2,069,042	Madison.
Missouri	3,106,665	Jefferson City.	Wyoming	92,531	Cheyenne.

Difference in Time (for Cable Purposes).

BETWEEN THE CITY OF NEW YORK AND THE PRINCIPAL FOREIGN CITIES.

LATER THAN NEW YORK.						EARLIER THAN NEW YORK.	
	H. M.		H. M.		H. M.		H. M.
Antwerp....	5 13.5	Dublin	4 30.5	Rio de Janeiro.	2 3.2	Havana	0 33.5
Berlin	5 49.5	Edinburgh	4 43.2	Rome	5 45.8	Hong Kong...	11 27.4
Bremen.....	5 31.0	Geneva	5 20.5	St. Petersburg	6 57.1	Melbourne	9 24.2
Brussels	5 13.4	Hamburg	5 35.8	Valparaiso	0 9.3	Mexico City of	1 40.5
Buenos Ayres.....	1 2.4	Liverpool	4 43.6	Vienna........	6 1.2	Panama	0 22.2
Calcutta....	11 49.2	London........	4 55.9	Halifax........	0 41.5	Yokohama.....	9 45.5
Constantinople	6 51.9	Madrid........	4 41.1				
		Paris..........	5 5.2				

THE ALLEY BOSS
H. B. Conyers

The American Annual of Photography for 1907

THE GARDEN HAT. Carle-Semon.

SNOW AND ICE CRYSTAL PHOTOGRAPHY.

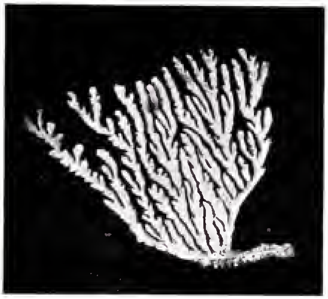
By WILSON A. BENTLEY.

AS all know, the snow crystal crop of the winter of 1906, owing to the phenomenally mild winter of that date, was practically a failure throughout the United States. In view of this fact, we take much pride in giving the readers of the Annual photographic proof of the fact that old Vermont's 1906 crop of snow crystals, though of course lacking in quantity, is yet up to the average as regards quality and general excellence. Though there were some seven different snow storms that furnished beautiful crystals, but one of these furnished such in large quantities and barely one hundred new photographs of snow crystals were secured during the winter. Window frost and window ice crystals were likewise much less numerous, beautiful and varied, than during ordinary cold winters, and but few photographs of such were secured.

Our most important photographic work during the winter of 1906, was conducted along new lines, and outside our usual lines of effort, *i. e.,* in securing a very beautiful and interesting series of photographs of growing ice crystals, while lying and resting upon the surface of freezing water.

ICE CRYSTALS.

It had long been our intense desire, our "day dream" to photograph ice crystals of this description, but their extreme thinness, and transparency of form, rendered this an all but impossible task. But we finally, after many failures and discouragements, perfected an apparatus, and methods whereby we successfully accomplished this most difficult task, and it is of this, and of them, that our text must principally concern itself. The formation of ice crystals, the "alchemy of the ice" whereby the fluid called water, is converted into a crystalline solid called ice, is a most fascinatingly interesting and instructive process. Yet, so tiny and very transparent are the individual ice crystals, and so silently and unobtrusively do they form and grow and multiply on pond and river, and merge to knit the very water together, that perhaps but few see their beauteous forms, or watch them at their seemingly magic task.

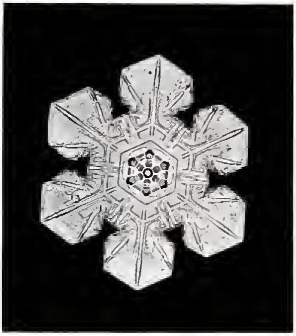


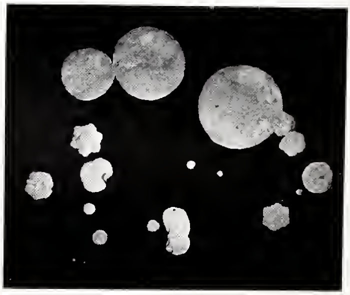
Yet, the whole wonderful process can be easily seen and studied, if viewed under the proper conditions of light and environment.

Possibly a brief statement of those conditions, and of the forms and habits of growth of the ice crystals, may be of interest to some, and especially to those readers of the ANNUAL who live in the southland where ice is a rarity.

Perhaps the best way to observe and study ice crystal formation and growth, and to watch the crystals pass through their wonderful life and form phases is to place a large piece of looking glass, flat down (glass side up) in the bottom of a pail or pan of freezing water, and set same close to and in front of a window within a very cold room. The first crystals that form, and also those that form afterwards, should be from time to time removed, so as to allow new ones to form and grow.

The most beautiful and interesting types, form and grow upon the surface of the water, and unattached to the sides of the dish or pail. There are some five or six varieties of ice crystals of this manner of formation, all of which, like unto many snow crystals, form upon a very thin tabular plane. Our photographs will serve to convey an idea of the forms an aspect of many of them.





They are all very tiny, when first organized. Some first appear in the form of tiny six petalled stars, or six cornered hexagons, while others form in needle-like, and various other forms. Perhaps the most interesting of all are those that first appear in the form of tiny, round, smooth-edged discs. These latter, when first formed, resemble tiny specks or films of oil resting upon the surface of the water. Ice crystals of this character are hardly thicker than common paper, and possess thicknesses of but from 1-150 to 1-250 of an inch. Each of these several types, as they grow and become larger in size, pass through characteristic and ever-changing form phases, peculiar to each. Each tiny crystal of whatever form as first organized possesses smooth edges.

But as growth progresses, tiny scallops form around their edges, and they pass into the scallop stage. Eventually some certain few, or many scallops, grow to a quite large size, and assume the role of primary rays or branches, and secondary branches form around the edges of the primary (scallop) branches, and they pass into the mature, or "branch-like" stage. Many of them, and especially such as grow apart by themselves, and isolated one from another, and that develop in the form of six petalled or hexagonal stars, are very beautiful and symmetrical at this stage of growth, and resemble the branchy six petalled varieties of snow crystals. Our photographs will convey some idea of the beauty of their forms. But few of them, however, under natural conditions, retain symmetry of form for a great length of time, or until they attain to a large size, because they merge and grow one to another. But they can be very easily "cultivated" as it were, by removing (poking away) crystals in their immediate vicinity, and under such "artificial" isolated conditions, they grow in a very symmetrical manner, and may be made to assume forms of large size, and of great beauty and complexity.

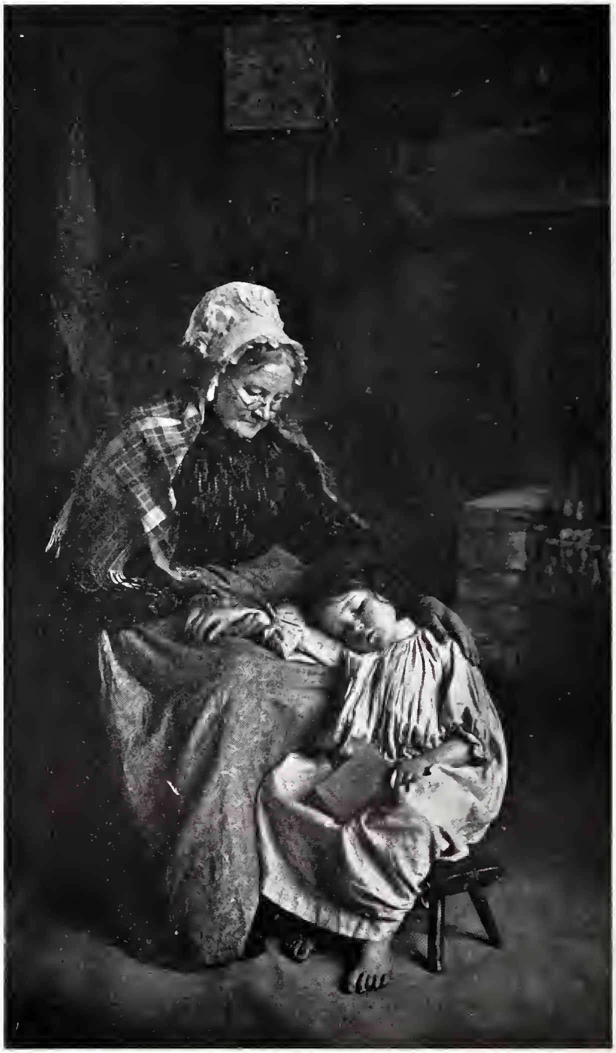
Space forbids a complete and detailed account of them, or of our apparatus, and of the methods employed in securing our series of ice crystal photographs, but we will give a brief outline sketch of our apparatus and methods. We used an extension camera and a ¼ size Dorlat portrait lens, in our work. The camera was mounted in a vertical position, upon a high rigid platform about four feet from and above the floor of the room, and in front of a window. A piece of looking glass (reflector,) four inches in diameter was placed directly beneath, but 41 inches distant from the lens, and 11 inches above the floor of room, and mounted so as to reflect the light of the sky upward through the lens and camera, and the glass dish containing water and ice crystals. A glass dish with a plain smooth bottom, to contain the freezing water holding the ice crystals to be photographed, was mounted directly below, but at the proper distance from the lens, and a long box tube 21 inches long and 7 inches in diameter blackened inside, was mounted in vertical position directly below the glass water dish, to cut off all side lights.

This tube extended downward toward, but did not approach nearer than 13 inches of the reflector. A medium sized stop was used in lens, and but from two to three seconds exposure made, using rapid plates. Final focussing was accomplished by using a clear glass in place of the ground glass, and a focussing microscope.

Perhaps the chief difficulties of ice crystal photography, consists in keeping the temperature of the room containing the apparatus and glass dish of water at just the right temperature, about 28 degrees Farenheit, (so that the ice crystals to be photographed will neither dissolve, or grow too rapidly) and in anchoring the ice crystals in position. They have a very annoying habit of wandering around upon the surface of the water. Tiny white threads strung across but resting upon the surface of the water each side of them will, however, anchor them in any desired position. In most cases, it is best to allow ice crystals to form and grow not within the glass dish under the photo lens, but within an observation dish of freezing water, placed in a colder room than that containing the apparatus. They can be "cultivated" therein, and when ready, dipped up in a cold, but not too cold spoon, and dumped into the water of the glass dish under the photographic lens. Care must be taken, however, to first take the "frost" out of the spoon, by momentarily placing same in the mouth, and then dipping it into the cold water, as otherwise the ice crystal will freeze thereon.

Doubtless but few of the readers of the ANNUAL, on account of the expense and the difficulties to be overcome, will undertake the actual work of ice crystal photography. But the wonderful phenomena of the ice, of the formation and growth and solidification of the myriads of tiny transparent ice crystals of which ice is in general formed, is of very frequent occurrence in winter time, and can be very easily seen and watched by all, in the manner as previously described, within the readers' own homes, and it is the hope of the writer that this short sketch of their forms and life history will call attention to them, and will induce many, through the hints herein given, and by the aid of a piece of looking glass and a dish of cold freezing water, placed as directed, to see and watch for themselves the wonderful manner in which ice crystals form and grow, and change their habits of growth, and eventually merge to form solid ice, under the influence of those marvellous laws that we call crystalization.

* * *



GRANNY'S TIRED BAIRN. John Hepburn.

STUDY
Elisabeth Holden

A SIMPLE ENLARGING APPARATUS.

By ALBERT STANLEY HULL.

IT is my purpose to describe and illustrate here a very simple enlarging apparatus which I constructed some time ago and which has given entirely satisfactory results. It is built for a 5x7 camera, but may be modified to suit the conditions which may exist is some other equipment.

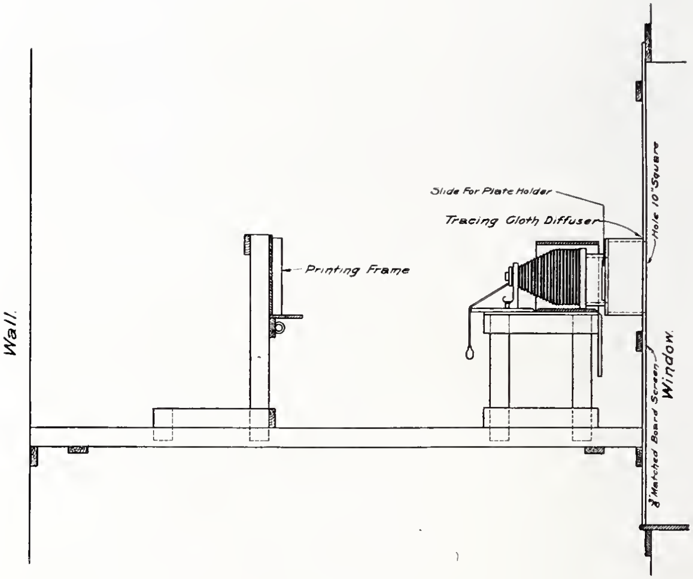
A window, which has a northern exposure, covered with a screen made of ⅜ inch matched boards, having an opening 10 inches square at a convenient height from the floor. A track of 1x3 inches is supported at one end by a cleat on the screen, and by a cleat on the wall at the other end. In case there is no wall conveniently near, a foot may be arranged to support this end.

A stand, high enough to support the camera in front of the opening in the screen, is constructed to slide on the track so as to adjust the camera in front of the light box.

The light box is made of light wood, about six inches deep and ten inches square. This has a hole in the centre of the bottom the size of the plate to be enlarged.

A piece of tracing cloth is stretched over the opening in the screen when the light box is attached and together with the white lining of the box diffuses the light before it passes through the plate. Over the plate opening, another box lined with black is built, deep enough to connect with the back of the camera. In this box is a slide to admit a plate holder. For this purpose, take an old plate holder and remove the partition. This provides a very light and convenient holder.

An easel, with shelf adjustable in height, supports a printing frame holding the paper. This easel slides on the track and its position controls the degree of the enlargement.



Apparatus for Making Photographic Enlargements

The focussing is done by placing a piece of white paper in the printing frame and when the focus is correct the sensitive paper is substituted and the exposure is made. It is of course understood that the room must be dark, the only light entering through the camera. I have a small opening in the lower part of the screen which furnishes my developing light, being covered with post office paper.

MORNING SHADOWS. K. Theodor Krantz.

CABBY. Dr. Albert R. Benedict.

PASSING OF A WINTER STORM. Chas. M. Shipman

NOT TOLD OF IN TEXT BOOKS.

By RICHARD TROTTER JEFFCOTT.

THE purpose of this article is to teach others some of the little tricks of "doing things properly" and the results obtained are due to practical use. Did you ever hear of a hot water bag being used in a dark room? No. A few of my friends have and the results from its use may be of interest. Procure an ordinary (2) two quart water bag, usually sold for 45 or 50 cents, and its uses in the dark-room are two fold.

In winter when the temperature is down to zero outdoors and the dark-room is not up to a photographic heat, take your water bag and pour into it about one quart of hot water. Lay the bag flat on your sink top, and on it place your developing tray. Have your developer prepared a little below normal temperature (65 deg.). The results will be that on completion of development your negative being subject to proper conditions for development will possess all the requisite densities. Reverse the conditions and imagine a hot evening in summer. You desire to develop those vacation plates. Take your hot water bag and place in it a fair amount of cracked ice, proceed as before and you will notice that the conditions are favorable for the production of negatives of the finest quality. A simple little dodge but worth trying when you most need it.

Ever buy a stirring rod about as thick as a lead pencil and think you had the daintest article of its kind? Well, the next time you want a stirring rod procure some pieces of Scotch Tubing ⅜x14 in., have your glass blower round off one end, and after you have used it for a while you will wonder how you got along without it. It is so strong it will not break easily and will readily crush the most obstinate chemical. Its cost over other rods is very slight.

When you think of making up an acid fixing bath where the formula calls for say five or ten pounds of hypo you wonder how long before the hypo will be dissolved. First procure an earthen jar with wide mouth having a capacity of say four quarts. Partly fill it with water and having placed a quantity of crystal hypo in a piece of cheese cloth, suspend it over the jar, permitting the bottom of your "pudding" to rest about an inch below the surface of the water, your hypo will dissolve easily and the cheese cloth will act as a strainer retaining the chips and straws one usually finds with hypo. This scheme can be repeated until all the hypo is dissolved.

The principle on which most plate washing boxes are made is decidedly wrong, as we find in the majority, the water is forced in at the bottom and overflows or is carried off at the top. Yes, I have one of this kind, but I am keeping it for presentation to the Photographic Museum they are going to establish some day.

What I use is an ordinary fixing box capable of holding 8/10, 5/7 or 4/5 plates. The box is of composition and to procure the best results I stand it in my sink (18x36) when using. To convert the fixing box into an up-to-date washing box, it is only needful to pierce two holes (at the bottom) at opposite sides of the box, such need not to be more than 3-16 inches in diameter, and placed diagonally opposite each other. An ingenious wire attachment holds the tubing in place at the top of the box and it is ready for use. Naturally hypo being the heavier sinks to the bottom and is readily carried off. This method cuts washing down to about thirty minutes, and in my mind this is amply sufficient.

Many amateurs like to have their prints show a white margin (not fancy designs which detract from the subject.) The general complaint is that it is too much trouble. Take for instance the various sizes of the Kodak and up to and including 5/7 plates. Masks for this purpose are readily cut from black needle or post office paper. For all sizes less than 5/7 use when printing a heavy 5/7 printing frame.

For each mask cut from 5x7 paper the desired size and fasten each firmly to sheets of clean glass (5/7) as many as you may require. Little experience is necessary to place the film or plate negative in position. The masks are always ready and should be kept in boxes so as to avoid collecting dust and grit. Circular and oval masks can readily be added to the assortment.

I often wonder why the photographic stock houses do not arrange to sell absorbent cotton cut into squares of 2x2 inches. It is much more convenient than tearing it from the roll when you desire to use it and far more economical. Try cutting up a roll and placing it in a box within reach and you will find it pays for the trouble.

A Hermit's Domicile. Jas. R. Iglick.

SNOW SHADOWS. John Chislett.

SNOW BOUND. W. H. Evans.

DEVELOPING FOR CERTAIN RESULTS.

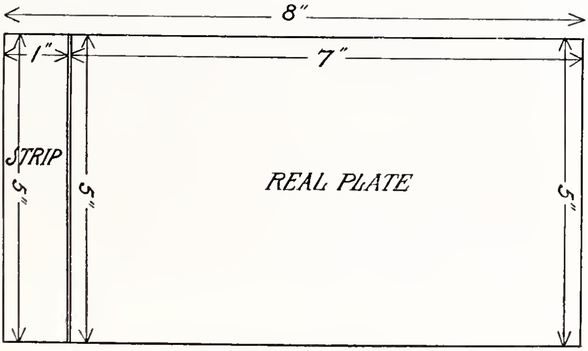
By DAVID GRAY ARCHIBALD.

A PLAN of developing for certain results, which means being able to tell exactly *how* your plate has been exposed *before* you develop it, is as follows:

Note that the claim is made (and well substantiated by the facts in the case) that you cannot modify your developer to get correct graduations *after* the image has appeared. My plan to find out what the exposure was, is to expose a piece of negative plate of the same emulsion along side of the plate thus: (See Figure 1.) Thus, working for a 5x7 plate, you would use a 5x8 holder. If the plate holder you are using will not hold plate and slip you will have to use slightly larger plates and cut off a strip after it is exposed.

Expose plate and strip at once and they will both get the same time, although the strip may not be in as sharp focus as your plate all over, as the lens will have to be put one side of your front board to get it in the center of your plate.

When you come to develop, put the strip in first and use normal developer to see how it will come up. Having found



Arranged for 5\7 Plate.

out how it is exposed you can then modify your developer for your plate to suit the exposure. When you come to develop you need hardly look until you know it is done, for you have done all you can for your plate.

Takes time to do it this way, did you say? Yes, but the results are satisfactory graduations and values not untrue to nature, as they are when you tinker with the developer after the image has been brought out.

SHE LOVES ME. R. G. Wilson.

GRASSY CREEK. Otto Fullgraff.

THE BUSY MAN'S DEVELOPER.

By RUSSELL W. TAFT.

MANY of us have not the time to dally with several sorts of developer or lengthy printing out processes; therefore, for the benefit of those to whom a saving in time appeals, I would suggest a one-solution developer applicable to plates, films and developing papers. It will be noted that the developing paper formulae call for rather more carbonate than plate formulae; therefore an excess of carbonate is used and the developer adapted to plates by a corresponding increase of bromide of potassium. If technique is a relative term, and is to be judged by results, my success with the following formula for the last three years amply justifies my offering it to a wider range of photographers through the Annual.

Metol ½ drachm or 30 grains.
Hydroquinone, 2 drachm or 120 grains.
Sulphite soda (Anh.), 1 ounce or 480 grains.
Carbonate soda (Anh.), 1 ounce or 480 grains.
Water, 25 ounces.

For developing plates use 1½ oz. stock solution, 6½ oz. water and 1 drachm, 10 per cent. solution bromide potassium. For over exposures or commercial work the proportion of stock solution may be increased in the ratio of two to four, while for extreme under exposures a still weaker bath may be first employed, transferring the plate to a stronger bath to acquire density after the detail has been brought out. For developing paper use equal parts stock solution and water, adding 5 drops 10 per cent. bromide to each 2 oz. stock solution. The same acid-alum fixing bath may be used for both plates and paper. and after developing the paper, more bromide may be added, and plates developed in the same bath. Thus I claim this to be the busy man's developer—simple to compound, clean, rapid and economical.

THE OLD MILL. John Chislett.

Black-Eyed Susan. Margaret L. Bodine and Nina F. Lewis.

NOW THE DAY IS OVER
Paul R. Morrison

ARTISTIC BORDERS FOR PRINTS.

By ROBERT E. M. BAIN.

THERE are so many books and magazines on art and artistic design that the selection of a series of frames or borders for prints is a comparatively easy task. It is not so easy to apply them properly, unless one has time and a skillful hand. A little effort, and a few films, properly exposed and developed, will make the solution easy. If the prints represent book illustration landscape or portrait, the negative can be scraped to the glass allowing the picture to exactly fit the film border, or, if only one print be required, double printing will accomplish the effect. The film border negatives may be made by selecting the design from book or print, focussing the camera on it, and after carefully covering the space (to be occupied afterward by the picture the border is to surround) by use of a piece of black velvet, or other dark material, the exposure and development follows and the result is one of a series which can be made to cover various subjects appropriate to landscape or portrait. If a friend with artistic skill can be induced to make original designs the result is apt to be more in keeping with the subject of the picture. Rainy or disagreeable weather is a good time to accumulate these border negatives, and one or two dozen will, if properly selected cover a large general field.

The space inside the border being quite clear under the velvet blocking out plan mentioned, masking the negative and border will be necessary, in case of double printing. When the negative of landscape or portrait be scraped, to permit of single printing for the full effect, the border film is placed over the glass negative and the printing paper over that, when the double printing proceeds in the single exposure. Care should be taken to see that the space within the border, in the border negative, be quite clear and transparent when single printing be adopted, otherwise the print will show spots or streaks.

DECORATIVE PANEL. W. and G. Parrish.

PROFESSIONAL VERSUS AMATEUR PHOTOGRAPHS.

By W. I. SCANDLIN.

SO much has been written and said upon the relationship between the professional and amateur, that it seems needless to open the question again. But there are still perhaps a few aspects of the case that will stand a little more light. The first is one that occurs to me as being ludicrously pathetic. The cry of a few years since that "the amateur is spoiling our business" has hardly died away before we find the professional pitching in, with might and main, to help him do this very thing. If the professional man believes the amateur to be a menace, why in the name of conscience does he accept the amateur's work and retouch his negatives, print and mount his pictures, and thus provide him with his only available means of becoming a real danger to himself? I know scores of photographers who do this regualrly and many who even advertise on their cards or letter heads that they do printing and finishing for amateurs. Of course, the amateur who practices this method is usually only a beginner, but he soon grows to something more, and if he is to be a menace to his brother craftsman at all, it will be because he received his help and encouragement at the start. In any event, don't help anybody to cut your throat and then howl if he succeeds in doing it.

Another point that occurs to me as being beyond dispute in this connection is that unless the professional can do his work distinctly better than the amateur of whom he complains, he deserves to lose his trade. This is a commercial age, sentiment has been cut out. It's the result that counts. If a country school teacher, a bookkeeper or an intelligent office boy can do better work than the profesional photographer, as a good many do, he ought to have it to do. What's more he is getting it and will continue to do so increasingly if we "don't watch out" and quality is the only weapon the professional has left to fight with. He can't compete in price, because he's got to pay his rent, help and other expenses, that the other does not have. Now what does he do? In nine cases out of every ten, he goes along turning out the same mechanical portraits that he made ten years ago—gives not a thought to any other possible styles, methods or fields of work, and cries out aghast when the amateur ceases to be an amateur and hangs out his modest little sign, "At home portraits a specialty." The amateur photographer has, during the past twenty years, received a liberal education. Thanks to the wisdom and enterprise of our manufacturers, the mechanical difficulties have been minimized, and through prize contests and photographic exhibits without number, he has acquired a technical skill and perception of the artistic that ranks him far ahead of many of his professional brethern who have been blindly following a rut for all these years. He had been learning that portrait work under the skylight is not all that constitutes photography, but that in the homes of the wealthy and refined there is a far wider and more profitable field. This field has always been open to the professional but how few ever cultivated it?

It is through this field to-day that large numbers of amateur workers are entering the professional ranks. Their amateur training with all kinds of apparatus, all sorts of subjects and conditions, tackling the most difficult problems, often with inadequate tools, gives them a practical knowledge of photography that many professionals lack. They become adepts in the use of artificial light and "are daily doing stunts" that make their professional brethren turn green with envy. I believe the day is coming when a much larger proportion of our photographic negatives will be made in the homes of our patrons than now. If such is the case it will be because our amateur friends have shown us how to make them. I know that I am not alone in this opinion and I also know that many of the most progressive studios are already catering to, and developing, this branch of their work with profitable results.

I repeat then, that unless the professional is able to meet his competitor in any field of work and beat him on the quality, whether it be technical, mechanical, artistic or otherwise, he has no just cause for complaint if his customers desert him for the better man whether or not he wears the professional button.

In opening up and developing this very important field of photography I believe the amateur has done an immense service to the professional. It will be more highly valued in later years than it is to-day, and if he has done nothing more than this, I believe that his influence has been far more helpful than harmful upon the business of his professional brother.

If the latter will follow closely the trend of amateur work in his own community he will find many suggestions that he may profitably apply in his own field.

Bridge at Night, Copenhagen. Th. G. Sorensen.

Grace Susan. W. and G. Parrish.

'07 PEPPER SAUCE FOR PLAIN ROAST OF '06.

By W. F. OLIVER.

MR. F. DUNDAS TODD'S "Plain Roast" in the '06 Annual gave me great pleasure at the time, and gives me additional pleasure now, since it furnishes me a most resourceful text. As all of last year's "Professional" readers will remember Mr. Todd at first referred to the status of the fraternity, and not only denied their right to be considered "professional" men but was unwilling to allow they should be acknowledged the equals of tradesmen or skilled labor. His attitude in this matter, while nominally due to the general lack of theoretical knowledge, was practically owing to the almost universal inability of portrait photographers to begin with a definite intention and attain that absolute result.

I believe it to be greatly beneficial for one to take a frequent inventory of their personal ability, at least, this has been my custom, on the principle that confession is good for the soul, and I discovered, long before the "Plain Roast" was served, that all of Mr. Todd's reproach to the fraternity applied most painfully to myself. I immediately set about endeavoring to improve my situation, but when I had made a mental review of my literature and possible opportunities, I confess, I was not a little discouraged.

Far be it from me to cast any reflection upon Mr. Todd; if ever a man deserved a crown for striving to make the fraternity "sit up and take notice" he is the one, but in considering my sources of information as a whole, it seemed one interminable tangle, composed chiefly of multitudinous formulae, for developers, intensifiers, reducers and procedures with pinholes. In fact, the main thing seemed to be how to overcome errors and their consequences, rather than how to avoid them.

The Pool. Mrs. J. E. Bennett.

In other words, Photography as an exact science seemed to be an undreamed of thing.

Along the artistic side of the problem, there seemed to be but little relief. The sum total of all criticisms appeared to be: Be sure to make everything just right, simply do this and every thing will be just right. The conventions displayed an imposing array of educational features, but entirely without continuity, or binding, to lead the anxious novice step by step, and when it came to the leaders themselves I began to feel that they were somewhat like the old astronomer told of by John LaFarge. The astronomer's young associate read and re-read various proportions beginning "It is easy to see' and being unable *to see* finally called the other's attention *only* to find that the old gentleman himself could not remember or discover the principles involved. Possibly I would still be wandering in the bliss of ignorance had I not taken a young assistant into my studio, which brought the problem of making a photographer, "while you wait," out of raw material.

I remembered that in some dim corner I had read of a man named Steadman who did freak things in the way of testing light with a piece of P.O.P. and was able thereby to make accurate exposures. Then, there was one Alfred Watkins,—he had an idea that plates could be developed with certainty to a definite array of gradation, at least, so it was very rarely hinted in an apologetic way. Hunter and Driffield "also ran" with a few high-flown nonsensical theories,—something about the number of possible gradations in a picture,—indicating that if one knew what it was *possible* to get, they might have a better idea what they should *try to* obtain. There was a possibility that one could pose their subject and arrange their light so they knew that they had a composition containing a certain few of the gradations possible in a portrait; then, they could test the light, if they had not previously done so, make a correct exposure, develop by an Ingersoll Dollar Watch, and produce a negative capable of reproducing the preconceived gradations upon the paper intended. No experimenting from "gas" to "gum."

Again let me repeat, let me emphasize that the magazines and text-books, as far as I had known them had been very nice about these matters. No one would accuse them of leading one astray. "Mix your developers with brains," that was the idea. "Photographs can be made anywhere, but pictures are made in the dark-room, and the developer does it," so they continued to pile up their half, the important half faster than mortal man could ever furnish brains, the minor half. After diligent research, I gathered the above fragments I have mentioned; in the meantime I had considered the various materials I was using, their high standard of quality and their unvarying uniformity and it occurred to me, what folly that I should waste such abundant opportunity for success and certainty.

So, to-day, while claiming no accomplishments, the various considerations involved in photography and portraiture, each have a definite meaning. When we speak of the light—the operating light— we do not say, "I guess it is pretty strong" or "rather weak" we say it is 12 seconds or 45 seconds, and we know. When we speak of developing, it is not "thick" or "thin," it is factor 10, 12 or 18. When the portrait is incorrect in gradation, we know the fault is in the lighting and we apply the remedy where it belongs. It is the same from the pictorial standpoint, as far as we can comprehend pictorial principles, they are considered in *definite relation* to a *definite photographic procedure.*

By presenting these lines in this publication, I realize I am doing practically the very thing I am objecting to in others, wasting printer's ink without giving any definite information, but I think I have made one point clear. The professional photographer has the power to compel a new and better class of literature,—to refuse longer to listen to the teaching that uncertainty represents skill, and corrected errors, science. It will be several generations before the portraitists can all be graduates of the photographic college, and progress must be maintained.

That these colleges are doing well by their students I am pleased to believe, yet I regret that the circulars I receive should continue this baleful emphasis of trivialities, that, on some occasions, fine chemical work, which has no excuse for being a *rarity,* should pass for art. If my plea is heeded, and I am not without sympathy, in '08 I will gladly come forward with a problem, if requested, and discuss it to a finish.

THE BROOK. H W. Schonewolf.

WHITE PASTE, AND HOW TO MAKE IT.

By HENRY F. RAESS.

THE unguentous character and other good features of white paste, such as spreading smoothly, freedom from lumps and being always ready for use are some of the advantages over the old and well known starch paste. From using a considerable amount of this paste, and being of an inquiring turn of mind, I was led to analyze a well-known brand. It was found to consist practically of dextrine. But what gave this dextrine the peculiar property so desirable? There was apparently nothing present which would account for it. Many mixtures were made, but none gave satisfaction. After a series of experiments covering several years the secret was at last discovered. It seems that aging is one of the most important factors. The dextrine solution when first made is thin and translucent; gradually a change takes place, and in about two weeks it has become thicker and whiter, and in about a month the paste can be used. The change does not stop here, but continues for some months, the paste becoming firmer and quite white. The rapidity with which these changes take place depends somewhat upon the amount of water present. The paste made according to the formula below takes about one month to "ripen." If it is intended to keep the paste, say a year or more, before using 25 to 33 per cent. more water should be added on account of the continual thickening. If the paste is too thin let some of the water evaporate by allowing the jar to remain uncovered. If too thick, work the paste with water to the proper consistence. The easiest way of accomplishing this is to put the paste in a mortar and incorporate the water in a somewhat similar way that a pharmacist makes salves. Another way is to melt the paste on a water bath, or in a double boiler, and add the required amount of water, it will then take several days for the paste to resume its proper consistence.

English	Formula	Metric
5 ozs.	Water	150 c.c.
5 1-6 ozs.	Dextrine, white	125.0
45 grains	Borax	3.0
1 2-3 ozs.	Alcohol	50 c.c.
6 drops	Oil cassia cinnamon	6 drops.

The oil should be dissolved in the alcohol and this solution added to the dextrine, after having placed the latter in a suitable vessel, preferably of agate or earthen ware. The dextrine and alcohol should be well mixed before adding the water, in which the borax should first be dissolved. After all the ingredients have been placed in the vessel, the latter should be carefully heated and the mixture constantly stirred to prevent it from burning. It is better to heat it on a water bath or in a double boiler. When the solution is quite clear, it should be strained through cheese cloth into jars. The above amount will yield about 12 ozs. of paste. Care should be taken that only white dextrine is used and not the yellow, the latter (see the ANNUAL for 1905, page 253) having different properties. The price is the same, 10 cents per pound.

LA FOREST DE VIERGES. A. Gomez Gimeno.

IN THE MARSHES.

G. C. Elmberger.

CARBON PRINTING FOR THE BEGINNER.

By W. W. LAKIN.

PRINTING in Carbon or pigment is usually looked upon by the beginner as a very difficult and troublesome method however much he may admire the beautiful results achieved by experienced printers, and certainly the instructions contained in the text-books. with their long list of failures to be met in working the process, are enough to deter anyone from trying this simple and interesting process.

Let me say for the benefit of the beginner that carbon tissue, as it is called, is made by mixing gelatine and colouring matter, such as lampblack, etc., and coating stout paper with the mixture, after drying it is cut up into the regulation sizes, it is then sensitised in a solution of bichromate of potash, dried, and exposed under a negative, placed on its support, (which may be anything that will stand hot water), developed, a short washing and the thing is done.

Now for details,—Get a packet of tissue, try warm black for a start, there are about twenty-five colours of tissue on the market, get also a packet of single transfer paper same size as tissue. Make up the following bath, which will keep a long time in the dark. Citric acid 23 grs., carbonate of soda 45 grs., bicromate of potash 1 oz., water 20 ozs., you can use the water hot to dissolve them as given, afterwards adding cold water to make the 20 ozs., then add strong ammonia ½ dram. When quite cold put sufficient into a deep dish so there will be a depth of about one inch, immerse a sheet of the tissue, remove the air bubbles and keep in the solution for three minutes, then place the pigmented side down on a sheet of ferrotype plate and squeegee as much of the solution as possible from it, using a scraper squeegee not a roller. You can leave it on the plate till it is dry, should you sensitise at night, place it in a closet when you go to bed, and when dry it will leave the plate itself, place it face to face between the leaves of a heavy book and put away for two or three days, it is then in its best condition for printing, be careful to protect it from the light when dry as it is then very sensitive.

Now take a piece of clear glass same size as your negative. and paste strips of black paper around the edges, you can make it as wide as you wish, but ⅛ of an inch is enough, this is called a "safe-edge" and is used to keep the edge of tissue from washing up in developing, by using a separate glass this way saves placing the paper on each negative.

Place the separate glass, paper side down in printing frame, then negative, glass side down, then black side of tissue, then fasten frame and put out to print. In printing carbon there is no visible image, but it will be quite simple if you will take another negative of the same density and place a piece of Solio or other printing out paper behind, and put that and the carbon out to print at the same time, when the silver paper is ready for toning the carbon will be printed enough.

You will be able (after a little practice) to look through a negative and judge the proper time for printing same, as there is considerable latitude in printing carbon.

Get your largest tray and put in plenty of cold water and immerse a sheet of transfer paper, film side up, after it lies flat, put in the exposed tissue film side down, when placed in the water it will curl up, but keep it under the water and in a minute or two it will commence to straighten out, just before it lies flat, grasp it and transfer paper by one edge, and bring them out face to face, and put on a hard surface, such as a sheet of glass, and squeegee together good and hard, work from the center out and never mind if it rubs up the paper, you will throw it away presently; then place between sheets of blotting paper and place a heavy weight on top for not less than fifteen minutes.

In the meantime put hot water in your tray, and when your thermometer shows it to be 95 to 100 degrees, immerse your paper, tissue side up, brush off the air bubbles and when you notice a black froth oozing out round the edges of tissue, gently lift one edge and draw back over itself, keeping both the transfer and tissue beneath the water, if it refuses to move easy wait a little longer, keeping the water up to 100 deg.. If you force it you may lose your print. After the tissue comes away you will see nothing but a black smudge left on the transfer paper, but the picture is there buried in the gelatine. Draw the paper on to your sheet of glass and holding it over your tray scoop the hot water over it with your hand or a large spoon, and in a short time you will see the picture gradually develop, the hotter the water the quicker the washing away of the pigment, when fully developed place it in cold water five minutes to set, then into a solution of alum ½ oz., water, 20 oz. for ten minutes to clear it of bicromate and harden the film, then wash in a few changes of water and pin up to dry, and the print is done. Great care must be taken to avoid touching the face of print while wet, as it is easily spoiled.

Such is the single transfer printing, which I think you will agree with me is very simple. It allows one so much control over the results. If you have a hard negative of the soot and white wash order, sensitise for four minutes, if your negative is a thin one sensitise for two minutes, if you have under printed use colder water to develop, if over printed use water up to 110 deg. and give it time.

This article is but a brief sketch, but I trust it may interest others to try this beautiful process, which is much simpler than it appears. Almost any colour can be had, and it is absolutely permanent, so that if correctly printed and developed you will have a picture which your grandchildren will look upon as a thing of beauty and a joy forever.

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Frost and Snow. W. E. Bertling.

THE FIXING OF NEGATIVES.

By J. C. HEGARTY.

ONE of the first lessons that the beginner in photography should learn is the necessity of doing every part of the work thoroughly.

He will exercise great care in some parts of the process of making a photograph, and be equally careless in that part which calls for caution. He cannot realize, that if the best results are to be had, every part of the process must be done in a careful manner.

Many failures and disappointments could be traced to this carelessness in working; failures that are attributed to poor plates or inferior paper, the amateur preferring to place the responsibility on the manufacturer instead of assuming it himself.

One of the most common and likewise most annoying evils that the photographer has to contend with is the tendency of his negatives to become yellow, or fade away in a few weeks, or perhaps a few months after development. I have frequently observed this fading and staining of negatives while looking over the work of amateurs.

Many negatives that showed great care in composition, exposure and development were ruined by a portion of the film being of a pronounced yellow color, while others were slowly but surely fading away.

There are many negatives made by amateurs that are of such inferior quality that they should fade away and fade quickly, but they do not, on the contrary they go far toward proving the plate makers assertion that, "A dry plate negative will last forever."

This fading, or becoming yellow, is due to imperfect fixing of the negative or lack of care in washing; the instruction books say "fix and wash thoroughly," but the advice should be fixed thoroughly and wash, for if a negative is perfectly fixed the elimination of the hypo becomes an easy matter.

This process of fixing is often hurried and receives but little attention from the amateur, he is prone to give the plate a slight wash under the tap and plunge into the fixing bath, then, as soon as the negative is clear, he removes it from the hypo solution not knowing that the film still contains a compound that is not soluble in water and which if permitted to remain in the film will eventually cause fading. The amateur should understand the difference between real and apparent fixing, and a few words about the chemistry of this process may be appropriate.

The action of the hyposulphite of soda is to dissolve all of the unreduced silver which is still sensitive to light. As the bromide of silver disappears and the film becomes clear, a double salt is formed, called silver sodium hyposulphite, this compound is not soluble in water but is soluble in a hypo solution. The excess of hyposulphite of soda in the fixing bath finally dissolves this double compound, leaving a substance that is readily soluble in water and which can be removed by thorough washing. It is then apparent that the negative is not fixed when the milky color disappears, this change only indicating the formation of the double compound. If a portion of the negative is not completely fixed that portion of the film will turn yellow on exposure to light and retard the printing, thus making an uneven print while the presence of the hyposulphite compound will finally ruin the negative. The remedy for this evil is thorough fixing, this can be accomplished by leaving the negative in the fixing bath for some time after the milky color has disappeared, but the better way is to fix the negative in two separate fixing baths.

When the bromide of silver is dissolved, that is when the milky color disappears from the back of the plate, it should be placed in the second fixing bath where it should remain at least ten minutes. All the unreduced silver is readily removed by this second bath, and the negative should then be placed under running water or washed in a tray, changing the water frequently, until all of the absorbed hyposulphite is removed, this will require an hour.

SHADOWS
Myra Albert Wiggins

It may be claimed that this result could be obtained by leaving the negative in the first bath for a longer time, but where a single bath is used it soon becomes charged with silver and discolored, it then acts slowly and the negatives often becomes stained, while if two fixing baths are used the plates come out clearer, the film is not softened, as it sometimes is after a long immersion in the single bath, and you have the assurance that the negative is thoroughly fixed.

Fixing the plates in two hypo solutions does not require more time than the ordinary method of fixing in one bath, and less time is required in washing the negatives. The first bath should be discarded as soon as it becomes much discolored and replaced by a fresh solution of hypo.

Let us, therefore, provide against the fading of our negatives by carefully fixing, which requires but little effort, and we will be rewarded by more permanent results.

TOM AND JERRY. William H. Zerbe.

A BIT OF OLD CHINATOWN (SAN FRANCISCO J. Edward Greene.

THE ART PROBLEM.

By OTTO WALTER BECK.

A PROMINENT Boston photographer, an active participant at conventions, gave it as his opinion that photographers' conventions had little to look forward to; that to them there was lacking a message. He felt that photography was a copying process and therefore was not calculated to sustain the public interest much less to increase it. This copying process he thought had almost reached its full technical development and whatever changes were to be expected in exhibits at these conventions would be confined to such variations in the pose as the taste of the day would bring with it, or possibly to some novelty in backgrounds, supplied by merchants.

These views I share so far as the copying process is concerned, but granting the extension of the technique to hand work on the plate, and we at once change photography the copying process to photography responsive to the creative impulses of man. This alteration in principle makes a way for harmony and picture balance,—the long sought for qualities.

The issue is not defined by good straight photography versus "faking." Clearly stated the case is that good straight photography can never be too good; it is the foundation. We must use our brains, however, to complete the work. We must erect the structure of beauty over it.

Those untrained in art believe that beauty in nature and picture beauty are identical. This error is fatal. The copying process employed to reproduce the likeness of a beautiful woman will not render a beautiful picture. On the other hand a very plain person when portrayed by the extended process of successful manipulation yields a result that is captivating.

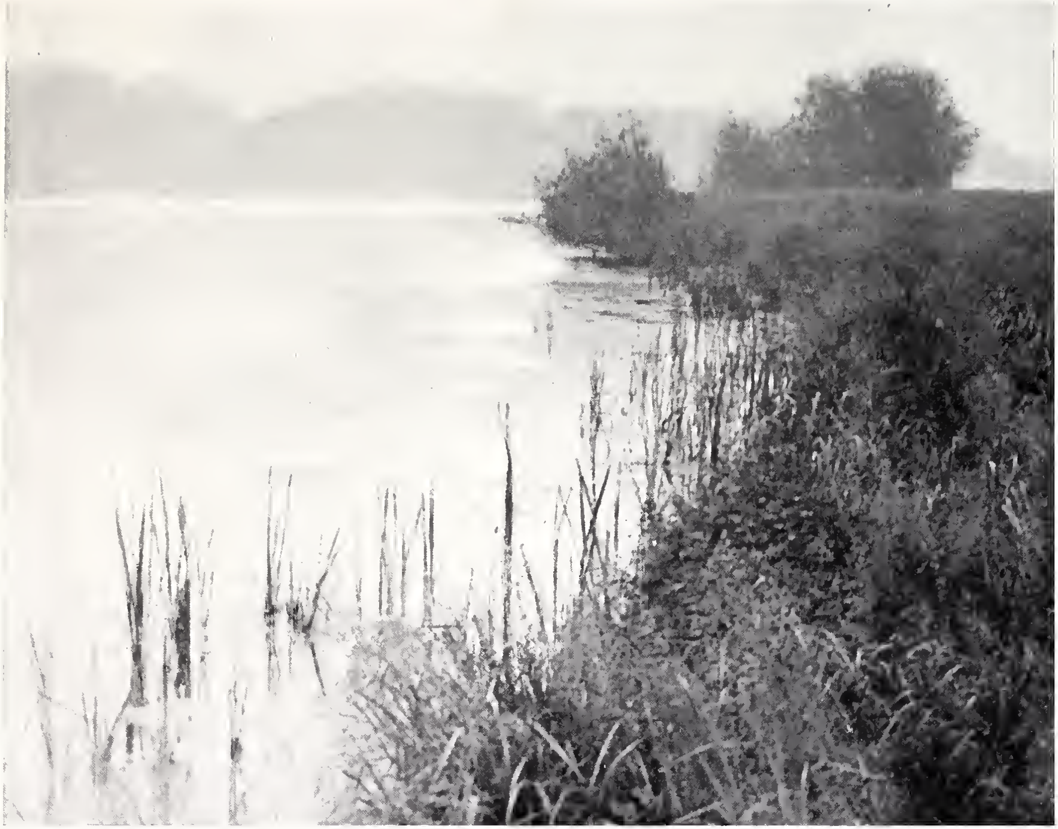
Pictorial beauty is the result of work of the brain and of feeling so expressed as to bring about in any representation a reflection of the author's thought and heart. It completely over-rides the mechanical.

If this is the case, and if photography to develop into art must embrace an increased manipulation of the plate, then there is but one great problem facing the organizations of photographers,—the problem, namely of art-education. Is this issue to be ignored? Is it to be antagonized? Is it to be met with indifference and over-ridden by the time-worn makeshifts of "essays" and "talks"?

Art training is a business. It means work, application, capital. It requires organization, perseverance in its pursuit propaganda, the creation of an art atmosphere.

Have conventions ever done more than to invite the essay and the talk on art? Granted the essayist is capable, what essays, what literature have ever been a practical aid to art unless supplemented by actual work? What lectures even though strengthened by the demonstration of principles can make an impression when the material gone over in one hour should represent the work of months in an apprenticeship! Add to this handicap the circumstances under which convention audiences listen to instruction,—amid excitement of festivities and rade demonstration. There is then no effective work for the promotion of art going on at the conventions. It is true that the photographers place on view examples of the year's best work. It is equally true that the best art education results from the seeing of pictures, yet even in the art centres of the world where great exhibitions are held there are numerous art institutions for the training of artists. Although photography cannot ascend to this parallel because it has still to win its place among the arts, yet it is sure to develop into an art. Conventions cannot withhold indefinitely the conditions under which art education shall be made accessible to the individual.

If the lack of structure in pictorial representation in photography's present weakness, the main purpose of the conventions should be to give the professional photographer aid in acquiring the ability to render pictorial work. But how is this to be done by a body having no fixed place of meeting, and



LANDSCAPE STUDY. J. Edward Greene.

undergoing change of administration yearly? Added to this is the fact that the members of associations are spread over all the land, are usually limited in means, and not at liberty to give much time away from business.

To overcome these difficulties, photographers at conventions must first accept the principle that art education is necessary, that it is vital to them to make it a part of their work. They must be willing to create and sustain a department devoted to art education, and must make the results obtained in this department accessible to all members, by distributing publications consisting of the pictorial problems solved in the central school.

When this policy is accepted and members are eager for work it will be less difficult to advance.

Every good worker in photography is conversant with some means by which he can make changes on the plate. Retouching is one of these means and it is called legitimate by all. Why not call equally legitimate an extension of retouching? The methods derived from such extension are effective in creating the right kind of background and in emphasizing or restraining the qualities of a picture. They make photography a free art since they open opportunities for the application of pictorial principles that in plain photography are ineffective because inapplicable. The important point is to know how to use these methods, and here the art instructor becomes a necessity.

The most efficient help to the individual comes when he studies art with a body of workers attempting the same problem. This is the school idea and it is quite possible for photographers to realize a school immediately. In the season of conventions work is not so pressing but that the photographer can extend his vacation from one to three weeks. Let a convention open its doors three weeks before the date of formal opening, equip dark rooms, provide plates, paper, cameras, etc., and invite all to come and work several hours a day under an instructor. The course in such a school should at first be simple. I sketched a plan in an address given this spring in Washington and published in the *Photographer* for May 22d, 1906. If fifty men work from the same model, each arranging the lighting, pose and background as he sees best, and these men all witness the transformation of their plain picture skeletons to pictorial completeness, each man will be fifty times better off after the first day's work. If a method is disclosed to him by which he can make a likeness into a real portrait in his second day's work, he has taken a memorable step from photography toward art. By the time the convention meets this body of trained men will be a help to all and photography will make rapid advance throughout the land.

It probably is a stumbling block to progress that photographers do not know that a picture is a "structure." It can be analyzed and made right. Every good straight photograph can be so treated,—out of the haphazard so characteristic of the copying process, can be made both beauty and logic.

If leaders at conventions takes a step to form such a school as sketched above, they will lay the foundation for a permanent institution for the benefit of their profession. How eager the workers are for improvement is seen in the circumstance that men do not hesitate to cross the continent to get a new idea. Such men could at their convenience attend the school while others unable to be present would receive the school's publications at their places of business.

This outline suggests a scheme by which photographers would have a control over the educational work. It would seem important that they should be independent in this matter.

The ideas here sketched may lead to some practical, definite outcome. I believe that dealers in photo-supplies will find it profitable soon to have instructors to point to the new advantages that the pictorial exploitation of the plate gives.

Even the kodak, and other snap-shot cameras have a future with an art side, as the film can be pictorially treated.

We now plainly have a message for conventions and it has a wide scope.

THE COUNTRY ROAD. Otto Fullgraff.

MENDING NETS
Mrs. Eleanor W. Willard

WHAT MAY BE DONE WITH A SMALL CAMERA.

By M. F. INGALLS.

IF you are the possessor of a good, though small, camera you have the advantage over the fellow who has only a large one.

You may take yours on many trips where he would not think of taking his. You can have enlargements made that are equal to, and more artistic, than direct work on a large plate. If you use films you may easily send them by mail—you may drop them, or even tread on them without injury. They are Isochromatic and have very good non-halation qualities.

In an experience of twelve years with all sizes from stereo 3½x3½ to 8x10 I confess that my favorite and constant companion is a No. 3, F.P.K., fitted with No. O series III Goerz lens and Auto Shutter. The camera is provided with those indispensible adjustments of rising and sliding front and automatic focussing scale. I carry this with me every day. Should I leave it in my room I would probably miss some choice bit—a fire, an accident, a parade, or what not, before the day is passed.

Even if it rains I take it along, for much good work may be done on rainy day subjects, with a good outfit.

The tank developing system exceeds all others for the maximum of good negatives from all sorts of exposures.

Negatives made in this way are exceptionally fine from which to make lantern slides, and this is the chief end of all my small work. Just now the "postcard craze" is on requiring small pictures, and so you are in the lead with a small camera.

If you are not quite satisfied with the results of your camera, just have an anastigmat lens fitted to it and you will be sur-

Broadway from "L."

Waiting for Snow.

prised and overjoyed at the result. The lens is the part that draws the picture—the others are simply the adjustments to a dark box.

A New York Steam.

The pictures accompanying this article were all taken with my 3¼x4¼ camera.

The one of the fire engine was a snapshot of 1/100 second, 4 stop (U. S.) about 3 P. M. in June.

The Pike—Luna Park.

The night scenes in Luna Park were taken with 32 stop, 4 minutes exposure on Eastman film.

Luna Park at Night.

Luna Park at Night.

The general view down "The Pike" was a 3 stop, 1/25 second —overcast day, at 3 P. M.

The general views of towers "Luna Park" was at a 16 stop, 25th second, about 3 P. M.

"Waiting for a snow storm" was on a light, but foggy day and "just a snapshot" in December.

"Just a little "Honey bunch" was an out of door snapshot at 1/25 second and 4 stop—under trees but good diffused light, as was also the one entitled "Tess." "Broadway from a moving "L" train" was, of course, 1/100 second, with a large stop at 4:15 P. M. Note the small amount of blurred effect on Subway station in immediate foreground.

LUNA PARK, CONEY ISLAND.

Many amateurs deter from making lantern slides because they imagine great difficulties, when, in fact, they are as simple and easy to make as gaslight prints.

The most beautiful pictures are colored lantern slides when well done. If you cannot color them, there are artists who make this their business and you can send yours to them to be colored.

A Little Honey Bunch.

CHILDREN AS PHOTOGRAPHIC SUBJECTS.

By J. ELLSWORTH GROSS.

Illustrated with some of his Photographic Portraits.

IN the last ten years photography has fallen into hands that have proven it a source of making portraits that have every artistic result. The material for the artist to work with is such, that he can manipulate it with the freedom required to carry out his thoughts. The camera is well adapted to making portraits of children owing to its quickness of catching desirable expressions. The artist must understand his instrument thoroughly and have all the surroundings at his command, then he must understand and appreciate child life. He must be quick to seize that delight which comes from simplicity of treatment, sincerity and directness of motive, such as the child's mother love to her baby doll or baby kitty.

In portraiture as in other branches of photography, work for a revealing of the character of a person, rather than exact delineation of features. We strive for that truth which is above mere realism, and try to bring out the most desirable qualities in the person, whether young or old, to do this the artist must be on the alert to get these essential characteristics, or the truth of the posers character upon which is based his personality.

The expressions must result from what is within a man, his sympathies and his best qualities rather than from plans and study, he must feel and enter into his work with his best aspirations.

This is true of all portrait work, but especially so of child life, as there is possibly no phase of art work which demands from the artist such a complete submission of himself, to that of his poser's spontaneous self.

The more a photographer works with little people, and the more he loves them does he gratefully recognize that the con-

"Mos' Bed Time."

ditions on which to base good work is that simplicity of treatment that is found in those master pictures of children which we class among those which are to endure for all time; that simplicity which suggests the nature and vitality of the body.

To keep to the trueness of the child neither he nor the photographer must work when exhausted or tired, for this work demands nerve strength.

Each child reigns in a personality of its own, and we must find the prominent characteristics of each little poser. It has been my custom when not using my camera, to give it over to a few of my children friends to "play take pictures," unconsciously they have taught me many charming effects Two of my little friends especially, both in their morning clothes, and their dress up attire, have spent hours posing each other, their dolls, and even put me in the group. In their innocent way

Cuckoo.

they chatter right on paying no respect whatever to my being a grown-up, in turn I am "Papa," "The Tographer," the "Doctor" and have even been left to act as nurse with all the dolls, while they go visiting.

When the time ripens to the purely simple and undefiled, I slip in a plate, and watch for a ray from paradise to suggest

Young Students.

pinching the bulb. In some of our play portraits we have had great success, as there was nothing to excite or distract the children, they have been doing something that was full of interest to them, they were happy and perfectly natural, it was play and not work, so not exhausting—in such cases I have had more chance to study the little posers than a photographer usually has—and more time to catch the simplicity I was after. These are tactful truths that might be given to the parents of children who usually accompany them to the photographer.

One of these little friends of mine came one day to have some "really" pictures; the child had looked forward to it in great exictement, both the parents had many suggestions to make, the same kind they do to the dressmaker, and tailor, the nurse and baby came to help distract the child. The results were to my mind "bosh"—but the parents were pleased enough to order, and also favored me by ordering from one of the play pictures, but I notice the re-orders and the enthusiasm are over the latter, but one great calamity, the play picture has not the hand-embroidered gown.

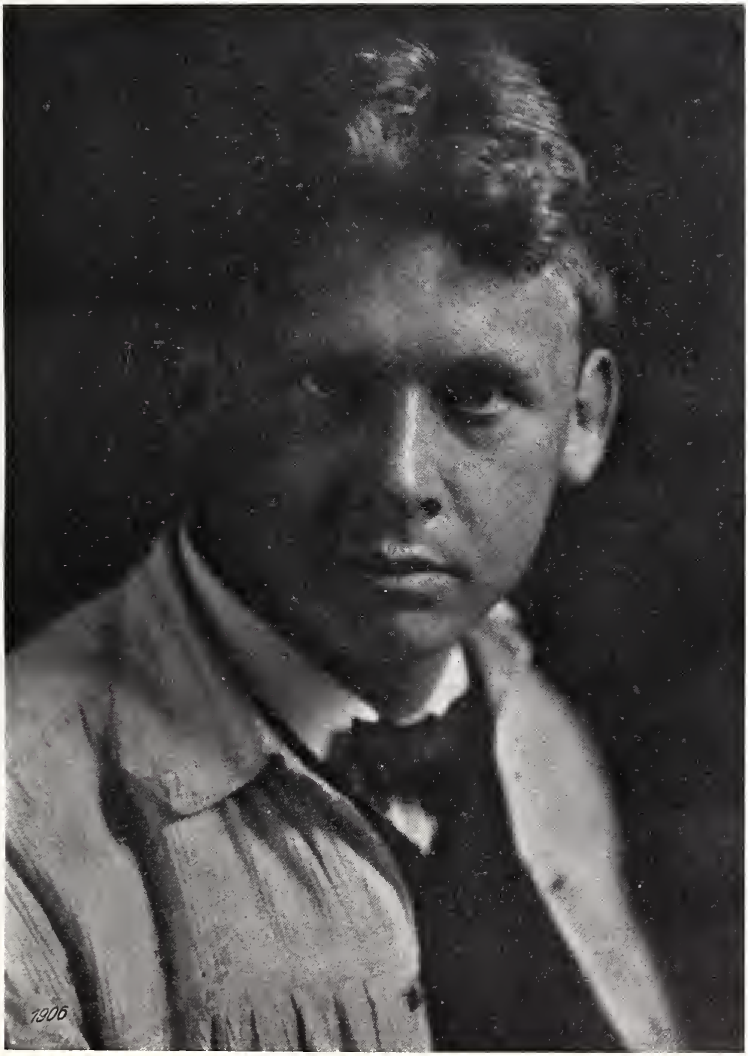
My series of news-boy life was brought about in the same way. I played "craps, matched pennies, ate wieners and dough-nuts, joined with them in stories and politics." One boy told me that "we made lots off yous'e selling extras, the time yous'e got hurt when that elevator felled."

They were delighted to be invited to spend a day with me, and I was a good fellow with them. They are fine boys.

At the St. Louis Exposition my twenty-five News-Boy studies attracted much notice. It is because they are the boys themselves, without the polish of brush or pencil, unwashed, yet true boys.

THE HARVEST MOON. Emily A. Corning

THE YOUNG READER. George Donehower.



HEAD OF A PAINTER. R. Dührkoop.

LABOR. W. H. Evans.

PHOTOMICHOGRAPHY AS AN AID TO CHEMISTRY.

By MAXIMILIAN TOCH.

THERE are a number of substances which are chemically the same yet physically totally different, and chemical reactions fail to distinguish between them. As a striking example, if a chemist were given three samples, one of graphite, one of lampblack, and one of diamond dust, the chemical report on all three of them would be the same, for they are all composed of carbon. The physical and the outward characteristics are different, so that it is possible to determine exactly what they are.

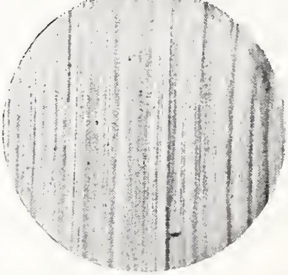
There are various forms of calcium sulphate, but the purpose of this article is to give one example and illustrate how perfect a distinction can be made between three varieties of the same chemical substance.

In certain chemical manufactures such as the lake pigments, and in the preparation of photographic paper of the Velox type, the surface is coated with a glazing material known as barium sulphate, and chemically it is impossible to distinguish between very finely powdered barium sulphate known under the name of "heavy spar;" coarse, angular and sharp barium sulphate which is produced from concentrated solutions and is used for making mat paper, and exceedingly fine barium sulphate known as Blanc Fixé which is used for printing ink pigments and glazed paper surfacing.

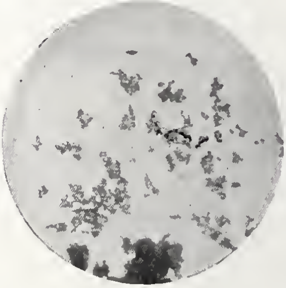
Photograph No. 1 represents the glazed paper variety of barium sulphate, which is magnified 500 diameters, showing barely any trace of grain.

Photograph No. 2 shows the crystalline structure of barium sulphate used for mat surfacing, in which the grain is sharp and angular and of appreciable size.

Photograph No. 3 shows very finely powdered and floated natural barium sulphate.



Barium Sulphate.
Fine Precipitate.

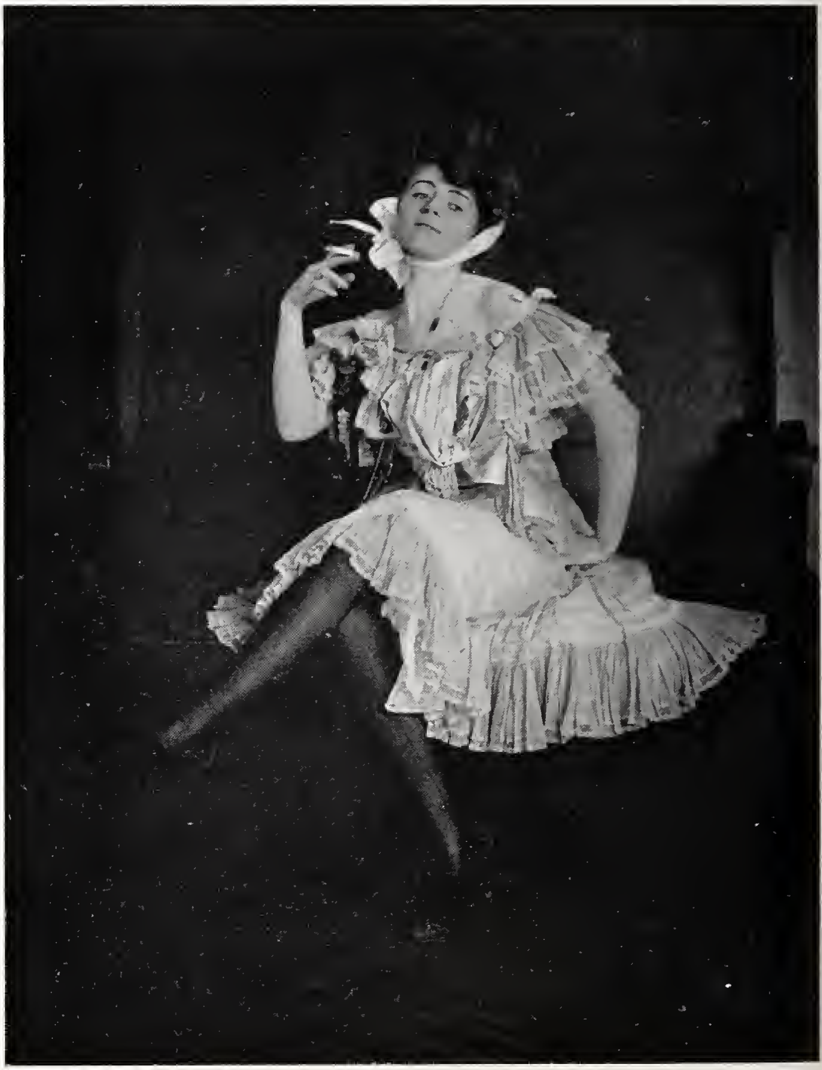


Natural Barium.

The value of these three materials differs very much both in the commercial and technical sense, and as they are never mixed for any given purpose, their quality and origin can be definitely determined, and records made by means of photomicrography.

Coarse Precipitate.

THE ROSE. John M. Whitehead.



CRICKET. Wm. Shewell Ellis.

A CALL FROM THE FIELDS.

By W. H. PORTERFIELD.

MAN is a creature of the fields; the hills and valleys are his natural habitat, so ordained by nature.

While the tendency to congregate in cities may have alienated him somewhat from the paths pursued by the generations gone before, there still lives in every one a strong love for the country, and its beauties will always furnish inspiration for the thinker; thus the musician catches a song from the wind as it sighs through the trees, and the poet a theme from the brook as it flows to the sea.

The artist painter has, from the earliest period, been a student of nature in all her wondrous changes of character, and so cleverly does he record the various phases that we are made to feel the lonesomeness of the forest, the sunshine of the meadow, the harsh and chilling winds of dreary winter.

The pictorial photographer must be susceptible to the voices of nature just as the poet or the painter, and with his limited material must convey the message which she speaks, be it one of sunshine and gladness or dreariness, rain and melancholy.

Each day and hour has its beauty, for nature is ever beautiful, but it requires an intimate acquaintance, a knowledge born of long study, to see and appreciate the more subtle changes in the wonderful kaleidoscope which is ever transpiring about us.

He who ventures in the fields only on the days of sunshine sees but one phase of nature, though truly a beautiful one. 'Tis then she wears a cloak of gladness, and all things both living and inanimate seem to unite in one grand song of praise and appreciation for the blessings of the sunshine.

But nature does not always smile. She has her days of sadness, when skies are overcast, the colors of the flowers are dimmed and the birds seem to have forgotten how to sing. Neither the poet nor the painter has neglected this enchanting season, and the world's store houses of art and treasure contain innumerable gems inspired by the days when fog and mist envelopes the scene and reduces the erstwhile brilliant landscape to one of monotone and simplicity.

The photographer has, generally speaking, devoted but little thought to his art under such conditions and while it is not the purpose here to champion the melancholy, it is an undeniable fact that those pictures which have touched the hearts of men and will live in the mind until memory is no more, have for their keynote a touch of sadness.

Now, the painter genius of fertile brain may conceive and execute his picture in a studio safe from the discomfiture of inclement elements, but the photographer (and here I refer to the landscape man) must go forth where the conditions actually exist in order to impress mind and plate with the story which he would tell.

It is true that photography under such conditions is not pleasant, but the true artist will think little of dampened garments or muddy boots when the reward comes in the form of a picture resplendent in atmospheric quality, perfect in gradations of distance and simplified in composition, as can only be had at such times.

One of the greatest, if not the greatest fault in the work of the aspiring landscapist is the unconquerable habit of including in his composition so much that is unnecessary, as well as the rendering of all objects both far and near with microscopic sharpness, thus absolutely destroying all pictorial effect which might be preserved by the exercising of the following simple truths.

Make a few trips to the country on rainy days when kind nature will assist you to simple compositions by the bewitching veil of mist, which so admirably separates each plain, giving you a reasonable amount of detail in the foreground, and rapidly diminishing as the scene fades into the distance.

The second point refers to the habit of "stopping down." Don't do it. Forget all about the F. system and the U. S. system, get your principal object in the proper place on the focussing screen and see that it has the required amount of definition

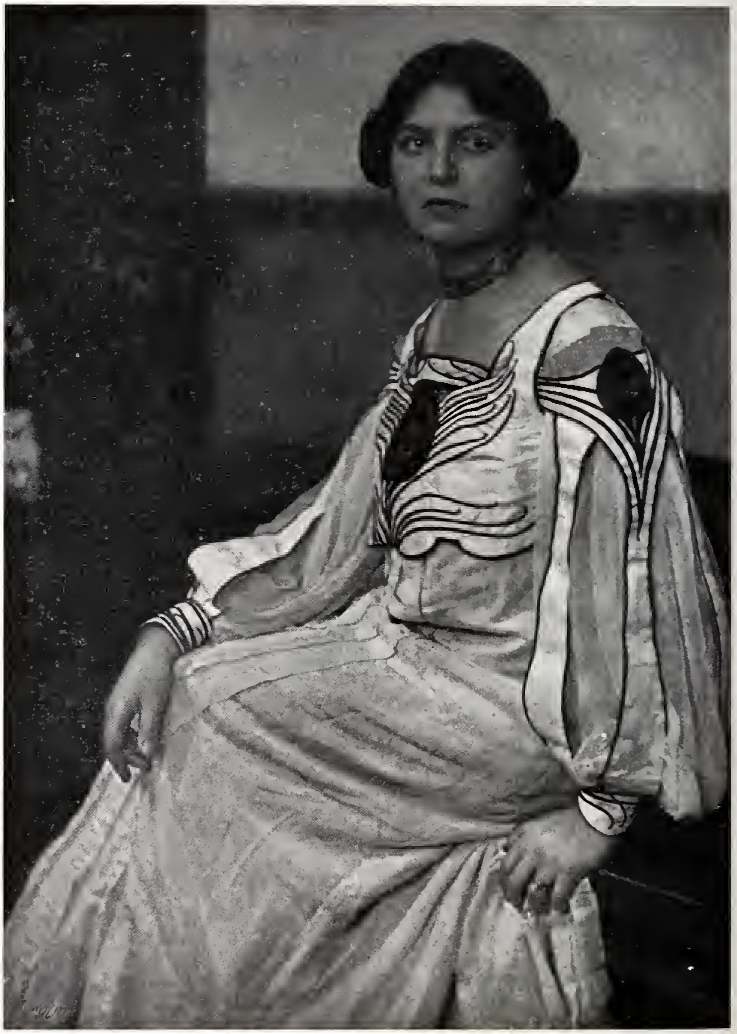
A GRAY FOGGY DAY
W. H. Porterfield

to make it intelligible and let the background take care of itself.

Avoid having two points of interest to your picture, one story is sufficient for one plate.

Remember that what brevity is to wit, simplicity is to art,, and when the photographer by his profficiency makes his picture speak without a word of explanation from himself, that moment does he become an artist and in the near future will be regarded as such, irrespective of his medium of expression or the present contention to the contrary.

O. C. Conkling.



Mrs. Dr. S. R. Dührkoop.

First Steps. Mrs. W. W. Pearce.

"THE KIDS AND THE GRAFLEX."

By MRS. W. W. PEARCE.

WHEN the nurse left in a huff I picked up my baby under one arm and the Graflex under the other and started for a little grove in the rear of the house to spend the afternoon.

If I had been "most mothers" I suppose I should have had a bit of sewing in that other hand—but, as I am Mrs. Pearce it has to be some kind of a camera.

It has been all kinds of cameras—from the Studio Portrait, 8x10 view, through the Kodaks—and has landed by sheer force of lack of time on the Graflex.

In fact, the baby would not be taken at all, if it were not for the Graflex and its film pack, for the time has quite gone by since the nurse departed, to work the more cumbersome instruments.

Do I want to show Miss Baby the pond full of ducks and geese—well we put the Graflex in front of the Go-Cart and away we go, baby and all.

And if when we get down there the pond is full of the "small boy" swimming instead of ducks and geese—well, that's a picture, too.

Or, on a long, hot afternoon we take a pitcher of lemonade and the kids over into the grove. Well! the circle is not complete without that same Graflex.

Long live the Graflex!

SECRETS. Mrs. W. W. Pearce.

My Bit of Sunshine. Mrs. W. W. Pearce.

Summer Afternoon. (Pin Hole). G. C. Elmberger.

ABEND STIMMUNG. Otto Fullgraf.

CHEMICALS FOR PAPER VS. CHEMICALS FOR PLATES.

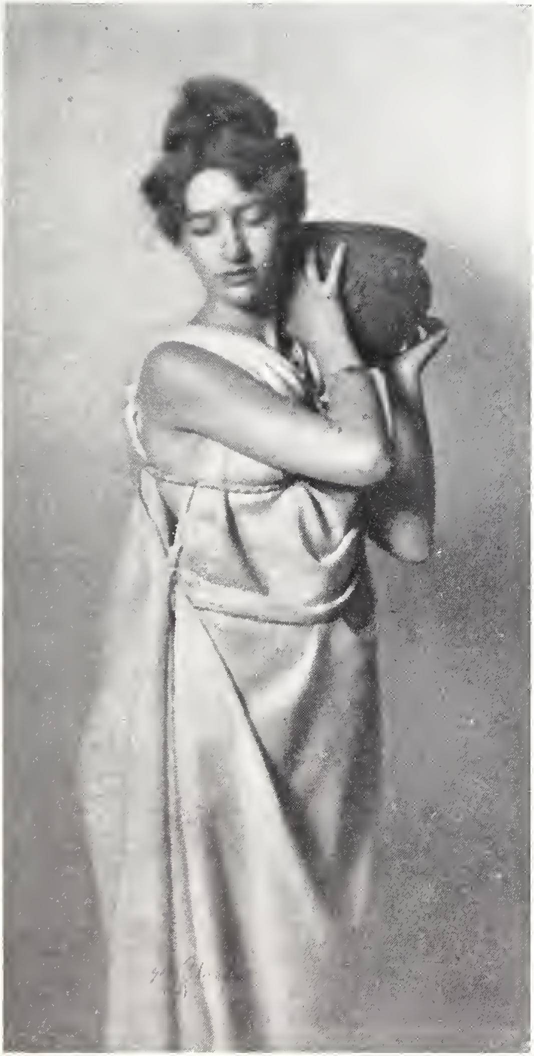
By MILTON B. PUNNETT.

CHEMICALS like human beings vary in their characteristics and action. If this statement referred to different chemicals the truth would be self evident. It refers, however, to different batches of what are supposed to be the same chemical. These variations are due to their comparative purity or impurity according from which standpoint they are considered. Another point which is not always taken into consideration is the use to which the chemical is to be put. For instance, it may make a great difference whether a certain sample of Sodium Carbonate is to be used in developing paper or plates, especially if the paper is one of the so called gas light papers—Velox, for instance.

As we look back we do not see our past life as one continuous kinetograph film unrolled, but more like the film of a Kodak tourist, dotted with pictures taken many miles and days apart. One of the pictures on memory's film is the cause of these lines.

I had been making pictures on Velox paper with a developer of known constitution, and obtaining, as every one does who uses the proper developer with that paper, good results. As an experiment I made up a developer according to the published formula, but using the Sodium Carbonate put up by a well-known dry plate firm for use with their goods, and which used for that purpose had yielded beautiful negatives. The prints which it produced, however, were not prize winners, without prizes are given for examples of what not to do. They were not green enough for carbons, nor black enough for platinums, they were just bad. Yet, knowing the plate reputation of this soda, had I not known that the paper was what it should be I would have blamed the latter. What may be called a "Chemical Explanation" of why this soda gave such poor results with paper and worked well with plates might be interesting to a few but would not aid the many.

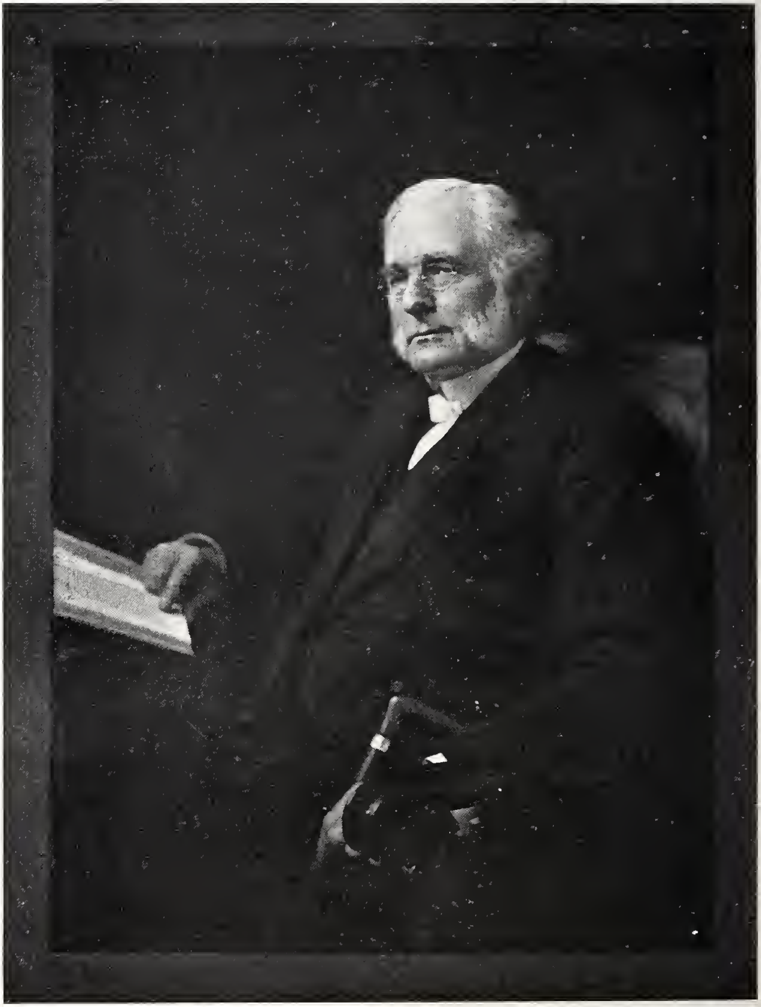
That certain ill effects are due to Sodium Bi-Carbonate, Sulphate, Hydrate, or any other impurity in the chemical does not interest the average photographer, for his thoughts are focussed on the central idea that it doesn't work and he will have to get some which will. He looks thoughtful, massages his head, and soliloquizes, "What shall I do? I'm no chemist; all sodas look alike to me; the fairest forms may give the greenest prints." Now, reader, it's up to you! What would you do in this case? There is a choice between two things; either experiment to see if by altering the proportions the desired results can be obtained or discard the chemical and buy fresh. Either one involves a loss of time and money, but the latter would most likely prove the quicker solution. I say "most likely" for there is no guarantee but what the second lot may prove as fair and false as the first. As it is impossible for all photographers to be chemists, the natural sequence is that they must have assistants who are. And, consistent with his innate modesty, why should not the paper manufacturer offer his services? He has the very best of excuses for doing so, viz.: the protection of his own interests. To me it appears like short-sighted business policy for a firm, say like the Mfrs. of Velox Paper, who use every endeavor to make only the most perfect goods, to place their paper in the hands of the users, knowing that the most unsuitable chemicals may be used in compounding the developing solution, and, at the same time, not giving the photographer the chance of buying chemicals of whose suitableness there can be no doubt. Admitted that the manufacturers have on the market solutions and powders which will give good results, there are still many photographers, both professional and amateur, who for many reasons prefer to mix their own developers. It has been said that "success in business consists in creating a want and filling it, or in filling a want already created." The "want" is undoubtedly already here, and the one who makes the sensitized goods, whose name will be the Hall mark of purity, is the one to fill it.



A GREEK SLAVE. Hana Robison.

Boy with Vase. J. E. Bennett.

THE GUILD HALL—COPENHAGEN. Th. G. Sorensen.



PORTRAIT. Baker Art Gallery.

PHOTOGRAPHING IN NEW ORLEANS.

By HENRY C. DELERY.

TO the camerist or tourist who voyages about the world in quest of picturesque and historical sights, New Orleans, the Metropolis of the South, offers a bounteous supply of the most interesting subjects. Having been under the domination of so many different nations, twice the French, once the Spanish, and lastly the Americans, each of which has left indelible traces of its reign, both in the diversity of their architecture and their quaint customs and languages; being the scene of many important engagements in the wars which ravaged the country from its earliest days; and at different epochs having been the abode of the titled nobility of Europe, one can scarcely wander through its older sections, but what we tread upon ground hallowed by precious memories.

New Orleans is eminently a city of contrasts, placing in juxtaposition the old world and the new. In the one we have the quaint high walled French quarter intermingled with which we find the severe exterior of Spanish buildings, with their spacious inner courts or patios, a reminder of old Castile; whilst in the other may be seen the modern, yet obtrusive "sky-scraper" and pretty modern villas of the residental district—one section living in a state of nonchalance, as if loath to part with its memories of two centuries, yet the other intensely American, where the march of progress may be seen from day to day.

To the tourist, who first enters New Orleans, nothing appeals with greater strength than the old dwelling of the French quarter, and one is strangely impressed by its queer and diversified architecture,—here a combination of brick and stucco, with French gabled windows opening into small balconies overhanging the streets, or else the stern forbidding aspect of a Spanish residence, and again, in some secluded spot, the unpretentious colonial home, its large inviting entrance being a fit suggestion of southern hospitality. Modest and retired and of unpretentious appearance, the Creole's home is nevertheless one of his most sacred possessions, among which cluster his most endearing memories and fondest hopes. Of old colonial design, where the rules of architecture have not been strictly followed, the long white stuccoed columns, rising from the ground, and extending to the projecting roof above, sometimes relieved by an intervening balcony, its large, but well proportioned entrance and wide airy hall, with living rooms on either side, form a unique plan, but one conducive to ease and quiet repose. In the garden grow the luscious figs, ripening in the summer sun, or a grove of orange trees, its golden fruit weighing its branches to the ground, and mayhap a sweet olive lending its fragrant perfume to the atmosphere.

REX—KING OF THE CARNIVAL.

There is perhaps no building in the whole territory which once comprised the province of Louisiana, which is associated with memories of greater historical importance than the "Cabildo," located in the heart of the old city. It was here that the formal transfers of the colony from nation to nation took place. This building was erected in about the year 1798, and was the meeting place of the Supreme Council of Louisiana, known as the Cabildo, from which it derives its name. It serv-

SPRINGTIME PORTRAITS
R. Eickemener, Jr.

ed for many years as the City Hall of New Orleans. Facing the Cabildo is the old "Place d'Armes," once a parade ground for the troops during the Spanish and French regime, but now beautifully laid out as a park, the centre attraction of which is the equestrian statue of General Jackson, marking the place where stood the flag staff from which twice floated the tricolored banner of France, once replaced by the red and gold flag of Spain, and from which ascended forever to remain the starry emblem of liberty. Adjacent to the Cabildo, and crowning the whole picture, stands the three spired St. Louis Cathedral, the official See of the Catholic denomination in Louisiana.

A SOUTHERN HOME.

A short distance below the city is the Chalmette battlefield, where in 1815 General Jackson with his sturdy Kentuckians and gallant Louisianians won the final battle of that war with England. The national government has commemorated the spot by converting it into a national cemetery. Slightly removed to the left is the unfinished battlefield monument, a plain shaft of white marble, standing like a sentinel on guard, watching the silent graves. A grateful people began its erection, and stone by stone it gradually rose above its surroundings, then a busy people forgot, and it stands to-day a shameful example of man's inconstancy.

Removed from the noises and turmoil of the city, a beautiful tract of land is devoted to the cemeteries, those "Cities of the

Dead" nowhere more appropriately named than in New Orleans. An unfavorable condition of the soil, too damp to permit interment underground, has required that tombs and mausoleums be built, some of exquisite and costly designs. The Metairie, the principal of the cemeteries, was once a famous race course, and rumor has it that a prominent gentleman of the city, desirous of becoming a member of the club and meeting with refusal, decided to purchase the grounds and changed it into a burial place. The former race track is still retained as a drive,

In City Park, New Orleans.

A Levee Scene.

and the rush and clamor of the race is now replaced by the slow and sorrowful funeral cortege.

Some of the burial grounds, located in the very heart of the city, contain the remains of many persons of note, who have figured quite prominently in the history of the country. Laid out without regard to symmetry, the tortuous aisles lead into intricate paths, among which the unwary may soon be lost. Curious epitaphs meet the gaze and the tombs are faced with a white marble slab, giving the name, age and nationality of the person therein buried. In older times, it is said, public burials were held, where the cortege headed by the clergy and the pall-bearers carrying the casket between them were followed by friends of the deceased, holding lighted tapers in their hands. But this lugubrious custom has long fallen into disuse, yet the little black-bordered death notice tacked at street corners, the relic of a custom derived from the French, still remains as a curio of the city.

Though the older quarters are a source of great interest to the visitor, New Orleans will prove as equally fascinating with its newer American section, better known as the "garden district." Wide airy streets lined on either side with stately trees, their spreading branches meeting overhead, forming a canopy of green, giving a luxurious shade in summer, or the magnificent avenues, dotted with pretty southern homes, standing like a thousand islands amid a sea of flowers. Oh! the New Orleans garden, well may its praise be sung in prose and rhyme the world over. Abloom the year around, it never ceases to breathe a sweet perfume into the atmosphere, creating a gentle balm, soothing and exhilarating to the senses. A veritable home of the flowers, where mother nature is lavish to a fault, and whose children love to bask in the southern sunshine and please the sight with their variegated hues. Few indeed are the flowers that do not thrive in this delightful southern clime, and its residents have not been lax in availing themselves of the bounteous offering of nature to convert their homes into large conservatories, unconstrained with walls, and whose only roof is the azure vault of the heavens above.

Scattered throughout the city, at convenient intervals, are spacious parks, the city's beauty spots, the most noteworthy of which are the City and Audubon Parks, both of decided historical interest, and which vie in beauty with the most famous in the country. Audubon Park, located in the American section, was formerly a sugar plantation, where it is reputed that sugar cane was first grown in Louisiana. It was the scene of the Cotton Centennial Exposition in 1884, the vast horticultural hall being the only reminder of this great event.

A Court Yard, New Orleans.

Avenues of magnificent oaks grace the landscape, and small lakes lend enchantment to the view.

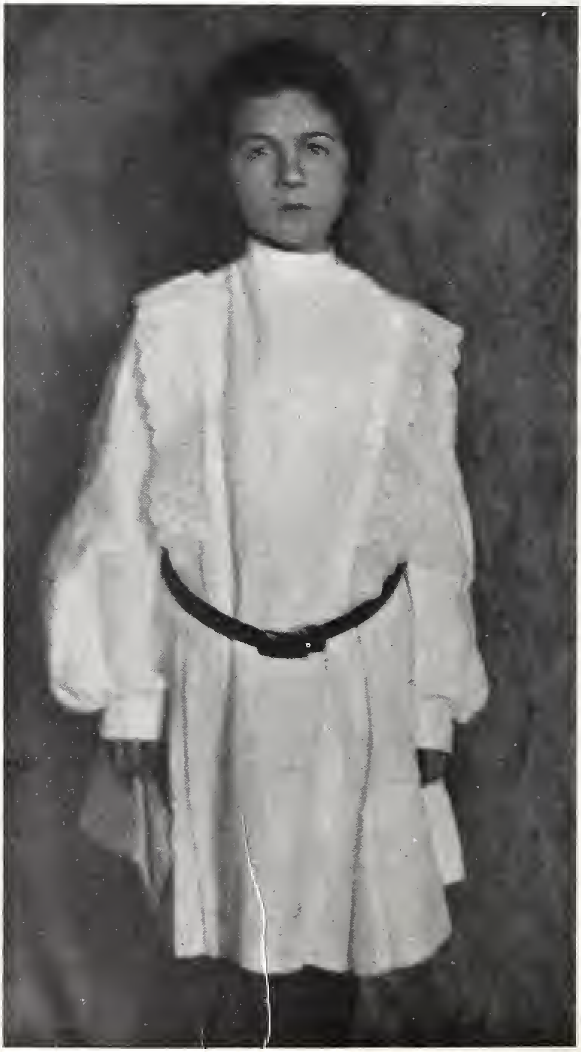
But by far the prettiest and most attractive is the old City Park, at one time the famous duelling grounds—the Oaks,—a grove of trees draped in Spanish moss. The Louisiana creoles, always very spirited and courageous, fought upon the slighest provocation and the least offense was ample ground for a challenge. Seconds arranged the details, the principals met, and the affray often resulted fatally. Fortunately these occurrences are exceedingly rare now, and one must inquire into the legendary past for records of such unfortunate happenings. Where was once heard the angry clash of the sword, or the murderous report of the pistol, is replaced by the joyous prattle of innocent childhood. This is one of the most popular recreation grounds, and but little remains to tell of its gloomy past. Contiguous to this park, a little stream meanders by, reputed as being the place where Bienville, the founder of New Orleans, first entered to lay the foundation of the city; and if we follow its winding course we soon reach the Confederate Soldiers' Home, pleasantly located, where the old veterans while their time, recalling old battle scenes, and quietly waiting for that grim reaper, Death, who spares neither friend nor foe. Continuing the journey, Lake Pontchartrain comes to view, and on its shores stands the crumbling ruins of the old Spanish fort, built by the Spanish governor, de Ulloa, as a protection against the marauding pirates, who infested the waters of the South in early days. The Lake is a large body of salt water, where may be seen all sorts and variety of vessels from the old walking beam boat to the modern racer. It is a great sporting ground, and furnishes abundant recreation to the aquatic loving public.

'Tis Not Always Summer in New Orleans.

A chronicle about New Orleans would not be complete if mention were not made of its Carnival. Beginning with the advent of the New Year, there are innumerable balls and social events culminating with gorgeous pageants on Shrove Tuesday, the eve of lent. After a triumphal entry on the Monday preceding, Rex, the Lord of Misrule, takes possession of the city, and gaiety reigns supreme. The Carnival of New Orleans is not rivalled by any city in the world, neither by the magnificence and splendor of its numerous pageants, nor by the spirit displayed by the populace, who enter whole-souled into the festivities. The streets are decorated with bunting, the carnival colors of purple, green and gold predominating, business is practically suspended, promiscuous maskers walk the streets, everything is jollity, and wonderful good nature, which is a feature of the celebration and is in itself remarkable, for no matter how thick the crowd, how dense the jam, everybody is smiling, and ill humor is conspicuous by its absence. At night the main thoroughfares are brilliantly illuminated, the clubs vying with each other to furnish the most attractive display. The lines of march are thronged with an expectant people, and the pageant heralded with brilliant fireworks and melodious music approaches to delight the eye of the spectator. A series of beautiful cars replete with magnificent glitter, rich in color, gold and silver tinsel, falling cascades, groups of nymphs, kings, gods and symbolic creatures, all serve to portray the theme of the artist imagination. The costumes are rich in the extreme, the materials being real silks and satins, with no deception to offend the eye. The pageants having passed, the crowd disperses, the lights are extinguished, and on the morrow all is but an evanescent dream of fairyland. Aye! in a day there is little left along the streets to tell of the brilliant festival which has just taken place. The people of New Orleans, though a pleasure-loving people, instantly resolve themselves to their more serious occupations.

Space forbids an extended description of the many other attractions of this delightful city, of its six miles of river front where congregate all sorts and nationalities of vessels from the tiny Italian "lugger," the palatial western river steamboat, to the leviathan of the deep; of the U. S. Naval Station, with one of the largest floating docks in the world, or the military barracks; the marine hospital and the many scenes, which are a delight to camerists. And one may wander unmolested, and expose films or plates to one's heart content, no permits being required, save an instance or two, as on the Government Reservation. One is always assured of a cordial welcome, affirming the fact that Southern hospitality is not a matter of empty words but of deeds.

On Lake Ponchartrain.



MADELINE. J. Edw. B. Greene.

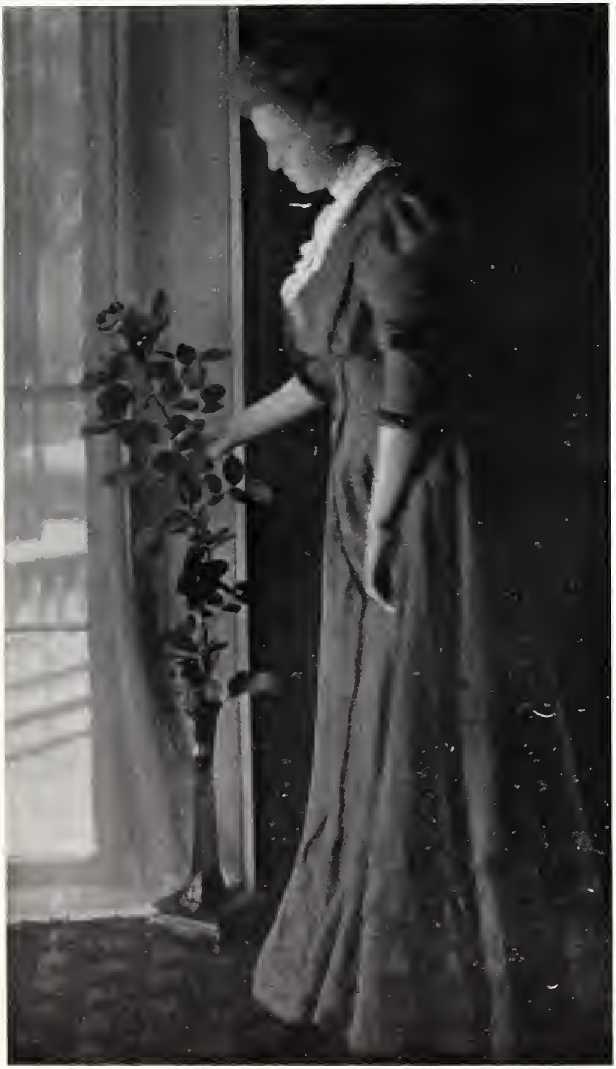


FIGURE STUDY. Fedora E. D. Brown.

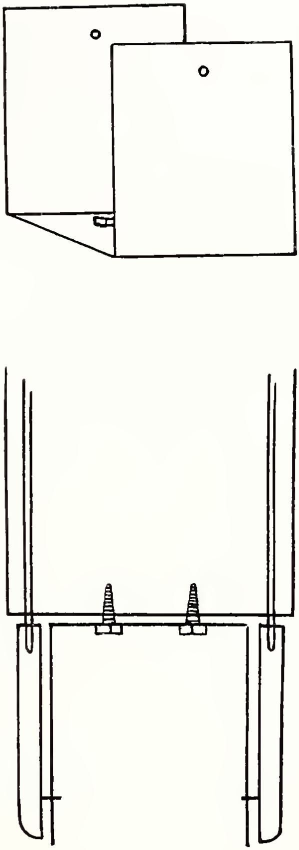
PREVENTING DOUBLE EXPOSURES.

By WILLIAM ARCHIBALD.

WHILE double exposures are sometimes made as a result of not turning the plate holder slide around, (before replacing it to indicate that the plate it covers has been exposed,) very often it is the result of our not noticing that the plate has been used.

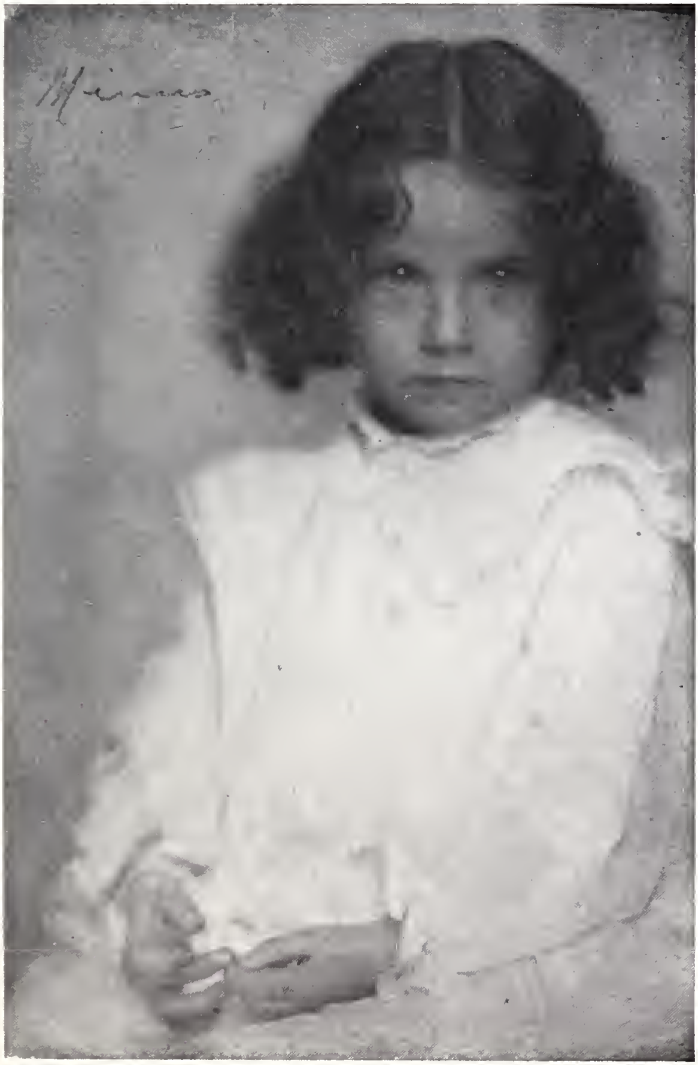
While the method I offer of overcoming the chance of double exposing will not entirely prevent it, it will eliminate it to a large extent. Eternal vigilance is the main thing to be depended upon. My notion is a catch at the top of the plate holder that prevents you from pulling out the slide a second time if it has been turned around after exposing; at least from easily doing so. It goes at the top of the holder and between the slide end pieces.

To make it, take a piece of ½ inch wide spring, brass, a couple of inches long, and bend it in the shape of a letter "U." This to be of the width to go between the holder slide top when they are in place. It should have two holes at the bottom of the "U" to allow it being screwed in place. There should also be a small hole drilled in each of the upright wings. When the slides are set for exposure, a peg placd in the top of the wood end piece of the slide engages in this hole. When the slide is turned the other way it will be possible to pull out the slide easily, but once it is reversed (done to show "exposure") it is held in place by the spring piece holding the top peg and does not come out except when you especially plan to take it. This simple device will save many plates and is easy to make.



Device for Preventing Double Exposures.

GENEVIEVE. Knaffl & Bro.



ELOISE. H. W. Minns.

A FEW LAMENTATIONS AND OTHER THINGS BY THE SNAP SHOT MAN.

By ROBERT W. TEBBS.

WHEN I received the letter from the editor of the Photographic Annual asking me to give him another article on the subject of Sporting Photography, I had a good laugh, as not an hour before, in talking over last year's article with a friend of mine, he said "Yes, old man, fools rush in where angels fear to tread."

And yet here I am going right at the same thing again, and maybe there was truth in what he said. I don't know it all. No, not by a long way; *but,* the little I do know, or think I know, I try to tell to others that do not know as much, and that may do some good after all. At any rate the old adage, "Nothing venture, nothing have," is as true as the adage that my kind friend sprung on me.

"Kismet," said the old man, as he rapidly packed up his outfit. "You can't beat it."

"What do you mean?" said the newly fledged photographer, with the flowing hair, and the far-away look.

"What do I mean?" snarled the old man as he started for the station on the run. "Look at the weather and then ask me another question as foolish as that. It never fails. I go ahead and plan out a big day's work for one of the events of the year, hire a couple of extra men, start out in the morning with a bright sun shining and not a cloud in the sky and then just before the big event happens, that I have come all the way from New York to photograph in the hopes of making a little money, up comes a big thunderstorm and all my expense goes for nothing. I tell you, you can't beat it."

This conversation I overheard at the Poughkeepsie races the other day as four or five hundred people were trying to get under a roof that in ordinary circumstances would cover twenty.

The old-timer was no doubt right as in a great many cases it certainly does seem that it rains on the special days photographers pray for a clear sky.

Look at the weather we had at the Florida automobile races. Six days' racing and six days' rain. And the poor, free lance, who brought along five or six assistants, was out of pocket some hundreds of dollars. Two years ago at Poughkeepsie on the big race day it rained. The same year at New London the weather was so bad that the races had to be postponed till the following day and even then the sun wouldn't shine. How many times the big International yacht races were postponed on account of the inclemency of the weather is now a matter of history. And so on down the line of big events. Sometimes we get a fine day but usually it is quite the contrary.

TAKEN IN POURING RAIN.

The weather is not the only thing the snap shot men have to contend with, though. On the day of the Po'keepsie races I had three dozen supposedly 6½x8½ plates and just as if the rain was not hardship enough the plates commenced to drop out of the holders as soon as the slide was pulled. On actual measurement there were not ten out of the three dozen that were 8½ inches long, the others varying from one to three sixteenths of an inch short. The good length plates were, of course, the ones that I did not want.

I am asked almost every day what camera is the best to use for fast work. I have seen as good work done with one kind as with another. It is all in getting used to the box you are using. A young man came to me the other day and said the Graflex was guaranteed to get the image sharp, and he seemed to think that it should do so unassisted. Photographing a moving object is just as much guess work with a Graflex as with any other kind of a box. I took this young man and showed him where I would focus to get a good picture of a man throwing a ball. He looked in the mirror when I was through and exclaimed "But you haven't got the man sharp." It took quite a time to convince him that when the man was throwing the ball he would be in focus. He imagined that the difference of nine feet which a ball player usually moves in throwing a ball would not cut any figure as long as he had the man sharp on the ground glass in the first place.

Two Miles a Minute.

The two baseball pitchers will illustrate what I mean. Standing on the same spot it required two different focuses to get the man sharp. Each one requires guess focus work and that is where experience in baseball work proves of inestimable value. You have simply got to learn by experience, and the more you have of it the better you get along. Tear the exposure table up and throw away half your books and get out in the open and you will learn a hundred times faster by the

EVENING
W. H. Porterfield

mistakes you will make at first than by following all the rules laid down by experts.

Rummaging among a lot of old prints the other day I came across the first newspaper photograph that I ever took in New York. It was at the time when McGovern was in his prime. I had been told to go out to his training quarters and get some good training stunts. I took Terry and his trainers into a nearby field and posed them with a beautiful background of trees and rocks and took some dozen pictures. I developed them and to me they looked all right. But when the manager of the Art Department saw them he almost had a fit. What in the ——— is all that background for? Do you suppose my artists have nothing to do but to paint out backgrounds?" Right there I learned a new lesson and never forgot it. Backgrounds are fine for magazines and private work but the newspaper wants the "meat" of the picture and nothing else. "Get big figures" is the cry. And when you have done that and show the result to the Art Manager he will mark off a little bit 2x2 and tell you to get an 11x14 enlargement of that. After a while you will get what they want without having to be told and then you are of some use to the paper. Nine

Courtney and his Companions.

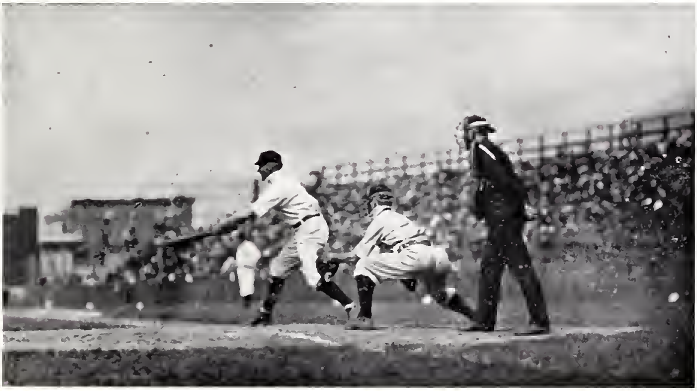
times out of ten it won't be much of a "picture" but it illustrates the story and that is the main thing.

Last year I made mention of the fact that newspaper photographers should always keep their temper. I feel inclined to amend that statement this year and advise strenuous measures in certain cases. For an example. One of the best photographers on an evening paper was assigned to get the picture of a young lady then in the public eye. He went to the house where the young lady resided and met her coming down the steps. She saw him and put her arm in front of her face. He said nothing but followed in hopes of getting a shot at her at some other place. The young lady went into a drug store and the young man placed his camera between his feet and prepared to wait for her to come out. Suddenly a foot shot from behind the young man and went through the back of his camera utterly demolishing it. The man was the girl's brother. The photographer had the man arrested, and when the case came up in court the judge dismissed the case claiming that the young man deserved to get his camera broken for bothering the girl.

A Study in Expressions.

The photographer was doing his duty by the paper on which he worked and I have no doubt disliked the job of taking the picture as much as the young lady disliked having it taken. The young man took the law into his own hands and was upheld in doing so. We are instructed that the court is the place to take our grievances, yet in this case when the grievance was taken to the court it was thrown out and the man that broke the law upheld.

There is an interesting case going on as I am writing. That of one of the President's body guard striking a photographer for taking a picture of the President. The photographer had the man arrested and the case is to be tried in a few days. Every photographer in the country should be interested in the outcome.



A Good Base Ball Composition.

If a man asks not to have his picture taken for some good reason, unless he is a criminal I believe in leaving him alone. I once said this to an editor and had to hang on to my job for a few weeks by my teeth till he forgot it. But I was rewarded recently by this self same thing. One of the greatest rowing coaches in this country has an antipathy to having his picture taken. I have occasion to visit him for a week every year and this year I had been particularly instructed to get his picture. So I went to him and stated my case. I not only got some excellent poses from the gentleman himself but he sent for the coxswains of his two big crews and posed pictures for me that I would not have the nerve even to suggest. If I had tried the trick of snapping him without his knowledge and he had found it out I should never have gone out with him again. Another man met that fate for the same reason.

Thousands of pictures are promised every year to people who assist photographers in some little way and these promises are very rarely kept. There are times when this is unavoidable, but many times it is neglected, the photographer reasoning that he will never see the man again so why waste the paper. But it pays to give the pictures if possible. A striking example came to my knowledge only the other day at New London. A man who has always been a priviledged character on the bridge was missing from his usual spot and I asked if anyone had seen him. It appears that he had been there and had put his machine in his accustomed spot but had been requested by one in authority to move it away. He put the machine up in another spot and a man accidently fell against it nearly throwing it in the river. Mr. ——— finally got wise and moved off the bridge altogether. He had promised one of the bridge officials a picture last year for some services the man had rendered. He sent the picture and also a bill for the same. The man returned the picture but remembered the incident. It is safe to say that photgorapher will not use the bridge for some time to come.

Well, I was going to write on Sporting photography but the other things I had to say have driven the Sporting photography ideas out of my head.

Last year I finished with a string of don'ts. This year I want to record a "do." Do for pity's sake get out of the rut. Because your great-great-grandfather used a certain brand of plates and a certain make of lens does that prove that the manufacturers have been asleep all that time? Just because he used a certain kind of developer does that prove that the chemists have thought of nothing new and better? Men come forward with the statement that the old things are the best simply because they are afraid to try the new. Try a little of the new things that come out daily and you will discover something simpler and better than you have got. Rapid strides are being made in photographic supplies and the man who is going to succeed is the man who is up to date.

In conclusion let me ring in the old saw

"You press the button, we do the rest."

How many hundreds of people are content to let this old Eastman saying form a part of their photographic creed. To the amateur I would say that by letting someone "do the rest" you are missing the best part of the picture-taking game. I have been doing photographic work for some years and yet today I can enthuse over the development of a plate as hard as I used to do when I was learning.

To the professional, and here I am talking to the newspaper man, and the free lance, I will say that to let someone else develop your work is an almost sure sign that you are not interested in photography. Quit right now and give some deserving man a chance. Some don't do it because they are afraid of staining their fingers. Others because it is too much trouble, and too hot in the dark room, anyway. But, if any mistake on their part has been made do you suppose for a minute that they will admit it. No, indeed, it is the "inside man" who is to blame. His developer is no good, or he has made some mistake somewhere. Do it yourself and learn what the mistake is and then perhaps you will not make it again. The ignorance of the average professional man of to-day

The Snap Shot Man Looking for Work.

as to why he does this or why he does that is one of the most menacing things of to-day in regard to the betterment of the work in general. They put two and two together and it makes four but why it doesn't make five is a mystery, and what is more they don't care.

Good Work.

To Fairy Land. Theodore Eitel.

EVENING. W. E. Bertling.

SELF INSTRUCTION IN PHOTOGRAPHY.

THE EXPERIMENTAL SYSTEM.

By MORRIS EARLE.

"OF the writing of books there is no end." This was said long before books on photography were written, but it would have been more justly said if the author had written it in this day and genera- graphy every week. Without disparaging the books, however, which are of tion when there is a new book on photo- great assistance I feel that the following out of a concise method is bound to result in information and experience being more readily and forcibly brought home to the amateur than in the reading of books. Experience is as much needed in photography as in any occupation, and perhaps more so, for the reason that a good knowledge of photography requires information along many lines. A good photographer must be a good optician if he wants to know the laws of light as applied to the photographic lens. He must be a good chemist so that he may understand the action of the elements that go to make up the developer. He should know about the laws of perspective and should study the art of drawing and painting to obtain artistic photographs. If he does not go into artistic or pictorial photography, he must learn something of mechanics or civil engineering or of the special science which photography leads him into. In other words, to be a good photographer in the line that a man devotes his attention to, he must study the particular science of that line. I have found in twenty years' experience no better system of instruction than the one I devised and adopted years ago, which I have used constantly in "teaching the young idea how to shoot," and greater progress has been made by following this "multum in parvo" method than any other system that it has been my good fortune to study. The main points to be observed in this method, however, are great care and accuracy in making records of every step taken. If this system is studied both in the field and in the dark room, it has never been known to fail in giving to the beginner a reason why his results are both good and bad, as it is the intention in this system to produce both good and bad results in the prints from all negatives obtained, which when obtained must be carefully numbered and studied to profit to the greatest advantage from this Experimental System of Photography.

THE EXPERIMENTAL METHOD.

This method consists of two systems of exposing and two systems of developing. In the First Experiment the exposures are all alike and the developers used are all different, whereas in the Second Experiment the exposures are all different and the developers all alike. It will thus be seen that there will be ten different combinations of the strength of light and developers used to produce these test negatives, which are to be studied carefully, in order to obtain the full measure of knowledge that they exhibit to the student.

EXPERIMENT NO. I.

Presupposing that the beginner has conquered the problems of focussing and the mechanical properties of his camera, take five plates or five films and expose them all in the same manner on the same subject within a space of ten minutes' time, being sure the light is the same in all the exposures, selecting a clear day for the experiment. Make the exposure in bright light with F8 opening of the diaphragm in 1/25th second. Refer to any text book on manufacturers' formula for directions for a developer. Mix the chemicals in accordance with the formula and divide into five equal portions in as many trays. Weaken the developer in No. 1 tray by adding 33 1-3 per cent. more water than there is developer in the tray; weaken developer No. 2 in No. 2 tray by adding 25 per cent. more water; leave No. 3 tray in its original strength; add to No. 4 tray 10 per cent. more of the ingredients used in mixing the developer originally as specified in the formula; add to No. 5 tray 20 per cent. more of the ingredients than the formula specifies. Mark the negatives with lead pencil consecutively from 1 to 5, put them in the developers marked 1 to 5 in accordance with the above system and develop them all at once and for the same length of time.

You will note that the negative in No. 4 and No. 5 will develop more rapidly than in the others. No. 1 and No. 2 coming up slowly. This will give the scheme of over and under developing very quickly for the reason that, of course, the exposures have been all the same. The variations come from over or under developing, due to strong or weak developer. When the image on negative No. 3 begins to appear on the back of the negative and the detail shown by transmitted light is satisfactory, remove all the negatives and place them in hypo, washing in running water. This set of five will be the ones that show the variation in development, and from this it will be easy to recognize what an over-developed plate looks like, and what an under-developed plate looks like, a very necessary ability on the part of the amateur.

EXPERIMENT NO. 2.

Experiment No. 2 is the method of testing over and under exposure. For this experiment, take five more plates or films and expose them all differently, using the same strength of developer for all, that being the normal developer made up under the same formula as used in Experiment No. 1. The exposing of the five plates or films in No. 2 Experiment should be made at the same time and condition of lighting as those of No. 1 Experiment are made. In these exposures use F8 stop the same opening of the diaphragms as in Experiment No. 1 and expose on the same scene that was used in Experiment No. 1. Expose No. 1 plate 10 seconds, No. 2, plate 2 seconds, No. 3 plate 1/25th of a second, No. 4 plate 1/50 of a second, and No. 5 plate 1/100th of a second. This will give a wide latitude of exposure and if you have exposed a plate in Experiment No. 1 instantaneously and a satisfactory result in 1/25th of a second is obtained in No. 3 tray, then No. 3 of this experiment will be the same. Putting all the plates in one tray or in 5 trays with the same strength of developer, develop until No. 3 plate shows proper detail and shows an image on the back of the negative. Now stop the developing of all at the same time and place them in hypo at once, washing as before in Experiment No. 1.* These two experiments are so entirely different as to test the variations of over and under exposure and the variations of over and under developing, with a normal exposure and a normal developing as a standard. Have prints made of all these negatives, marking them from 1 to 10 and it will be evident that they are a test set of prints and negatives, which can be referred to and studied to obtain the proper sort of experience under which a negative should be made, until it is easy to calculate the proper exposure and proper developing.

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* It will be seen that No 3 plate is the correct exposure, whereas No. 1 and 2 plates are over-exposed and No. 4 and 5 plates are under-exposed, this set of negatives giving information as to the correct and incorrect methods of exposing a negative, the incorrect showing over-exposure and under-exposure

These are short experiments, but a crucial test for the beginner to make who is willing to undertake it, and he will get greater results from this system, I believe, than from any other method that has thus far been devised. My experience has shown me that if you follow this plan you will obtain judgment from such experiments very rapidly and have wasted less time and material than under any other system. The usual habit for the beginner is to expose according to what his friends advise and he may get a good negative at once, but not knowing exactly how or why he obtained the negative, he goes on blindly and his judgment is not improved at all, and with the discouragement that follows failure, he gives up photography believing that it is impossible without much experience to obtain satisfactory results. To follow out these two experiments would take only about three or four hours and information would be obtained and judgment ripened at once. With the hope that this short treatise on photography will lead to satisfactory results and be a help to beginners in the fascinating art of photography, I have thought it reasonable to dwell on the scientific side of photography, knowing that science in photography is as desirable as the art that we hear so much about. One should be better pleased to take a photograph scientifically correct, at the start, whether it is artistic or not, for the art will soon follow in the steps of the science, and if a little more attention in the beginning is given to the science, there will be much more art in photography, and the amateur getting better results by the following out of such a system as I have sketched out, would obtain better results and would find greater uses for photography than a mere pastime, as it very often is.

A SONG OF THE SEA. H. W. Schonewolf.

THE FIRST SNOW FALL. Jos. R. Iglick.

THE ART PHOTOGRAPHER'S MODEL.

By DR. R. W. SHUFELDT.

Photo by Dr. Shufeldt.

PROBABLY no one of the larger cities in this country can offer the student of the art study of the figure any better facilities than New York, and perhaps some of them not as good. In more ways than one the very vastness of the place has its advantages in this field, for the artist is not likely to be disturbed in his labors, while the remarkable diversity of the mixed population of the metropolis furnishes representatives of a great variety of the world's existing races. This being true for the artist and the sculptor, it applies with equal truth with respect to the art photographer of the figure. When I say this I am aware that in the estimation of some of the older devotees of the brush and canvas in this city I utter a heresy, for there are still those among them who consider that photography possesses no claim whatever to a place among the fine arts. But I am an old offender in controverting this statement both by word of mouth as well as in the press, and so strong has the feeling been in some quarters in consequence that I failed of re-election in the Art Workers' Club for Women last summer for the reason that my ambition and labors lay without the scope of "legitimate art." This remuneration for the aid I had extended to the Club in question, and my good wishes for its success, was received with complacency, for there is no far-seeing person to-day, and even he will not have to peer so very far into the future, but knows

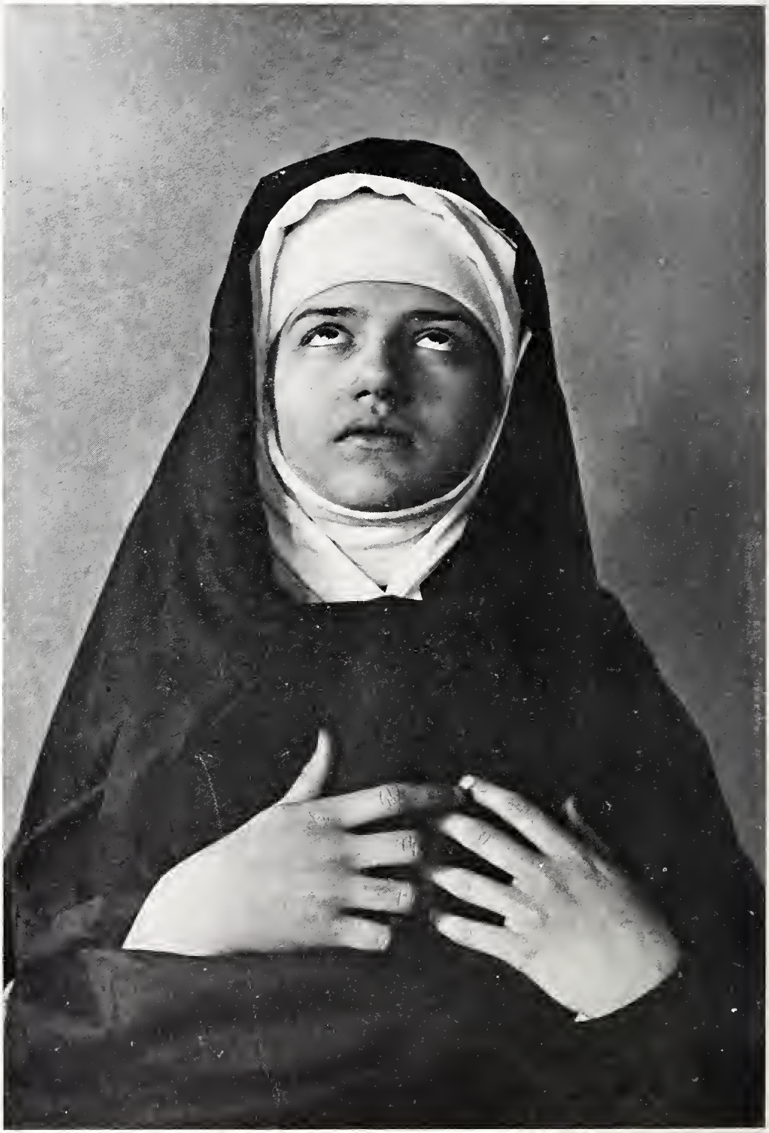


Fig. 1—THE NUN. Posed and photographed by Dr. Shufeldt.

SPRINGTIME
G. Edwin Keller

of the place that photography has justly earned for itself in art, and how that position is being strengthened every hour that passes. This not only applies to the study of the figure but to every other department wherein its activity lies. With respect to the photo-artistic reproduction of the human figure under varying conditions and in many kinds of places, the art has made enormous strides within comparatively recent time, and experts in this department of the craft, in all parts of the world, have given us many admirable and useful results. And, it is within these fields, too, that the art photographer enjoys some of his most valuable experiences, and meets with pleasures not associated with other lines of his work. There are many reasons for this, and they are not far to seek nor difficult to comprehend. First and foremost among these stands the unusual opportunities it offers to study and compare the various characteristics, organizations, natures and temperaments of the vastly different kinds of people he must necessarily be brought in contact with, and these not only include his models but divers others who have occasion to visit his studio. Then, in so far as the former are concerned, should the artist chance to be well-informed in the sciences of biology, ethnology and medicine, he may not only study the characteristics just enumerated, but intelligently compare these with all the physical and morphological characters their forms present, both the normal and the pathological ones. Many excellent opportunities are offered, too, to compare the anatomical and psychological characters of people, and that in a way not usually presented to the student. When I say this, I refer especially to comparisons made of topographical anatomy on the one hand with the psychological peculiarities of the subject studied on the other. In the case of the undraped model this can be easily accomplished without the knowledge of the person so studied at all, and I never neglect opportunities of this kind.

Within the last few years I have made several hundred photographic studies of the nude model,—men, women, and children,—with the view of illustrating my published works in this particular field, and especially for my book, *Studies of the Human Form,* and from these experiences much has been learned along the lines indicated in the foregoing paragraphs. The majority of my models have been selected from among the gentler sex, and for many reasons the results appear to appeal most forcefully to the reading public, while next to them come children. Models of men do not seem to attract the same amount of attention except strictly within the realm of pure art, and the sphere of the craftsman, whose vocation it is to reproduce them in their work. After the artist comes to be known in a great city like New York, and the various classes of models commence to regularly come his way, it will soon become apparent that they flow into his studio from not a few and entirely different sources. It is the object of the general student of the human form to select the best representatives from all of these various classes and to study them, photographically and otherwise, to the very best of his ability. There is no trouble about this as the supply is practically unlimited, and success depends entirely upon the taste, capacity and the scientific knowledge possessed by the artist. Through the exercise of natural tact, and honesty of purpose, associated with a genuine

A MIDSUMMER STUDY. Posed and photographed by Dr. Shufeldt.

reputation for fair dealing, for being a true lover of the craft, and a gentleman in the best sense of the word, the latter will soon come to learn that womenkind are by no means averse as a rule, to have thier figures taken "in the altogether," a matter in which they exhibit great good sense and appreciation of the beautiful.

Confining ourselves to this sex for the present then we soon come to recognize the fact that by no means do all our models engage in posing for such remuneration as it may bring, for this is far from being the case. This is true, however, for a certain percentage of them, and quite irrespective of the question as to whether they enjoy the pursuit or the reverse. Many take pleasure in it—indeed, are passionately fond of it, while to others it is extremely distasteful, a dislike that might well be described in even stronger terms. Of these two classes we may meet with in the first not a few who have received excellent educations, are refined, possess an unusual knowledge of art matters, and have a strong desire to further the interests of the profession. According to circumstances, they may or may not seek remuneration,—they are my favorites as models. The second class invariably demand the latter, are forever deploring their unfortunate lot in life, are unsympathetic and complaining, and, unless they be of especial value to me as studies, of one kind or another, I discourage their accepting engagements at my studio. Very well do I remember a subject of this kind that I employed about a year ago, and I made several negatives of her truly beautiful form, but had it not been for this latter circumstances, the acquaintanceship would never have proceeded so far.

I have had numerous cases of girls ranging from six to sixteen come to me for employment, and posing, that are invariably accompanied by their mothers. Frequently they are of excellent and well connected families, and are educated, so far as one would expect to find it to be the case in children of those ages. Models of this class are often very beautiful and possess exceptionally fine forms, and there is a reason for this. Their fathers having died, and the mothers left in straightened circumstances, the daughter or daughters help out the family exchequer by taking up the work of an artists' model. Their rare beauty soon suggests this to their mothers, whereas were such children plain in appearance and with ill-formed figures nothing of the kind would be thought of. Some of the most winning little models I have ever known have belonged to this class, and they have furnished me with some of my very best results. Not infrequently when such girls become older they pass from under the chaperonage of their mothers, and, having retained their charms, improved themselves in womanly requirements, it is by no means an unheard of thing to have some wealthy artist of good position and family marry one of them,—and then all is different, and the old posing days, from studio to studio, are well nigh forgotten, and in any event a thing of the past.

When their fortunes do not assume this course, and their fate to remain maids is sealed forever, a model will frequently follow the calling to a ripe old age, even to the point of dying in harness. I have several charming old ladies on my list who have been figure models for the New York School of Artists all their lives long. One of these is nearly seventy years of age, and plenty of them over forty. Then they all know Miss Hattie Bahr, one of the veterans of the best studios in the city, and an old habitué of all the Life Classes and the primary art institutions. Many a time she has posed for the writer in the "altogether," and I have made pictures of her in some of her characteristic costumes. She makes up these latter herself, and takes great pride in their exhibition, and to tell the truth she is an excellent model yet in many ways. (See Figure 3.)

The pressing demand for desirable models in New York has resulted within recent years in the formation of one or two now well-known Art Clubs wherein the models are members, and the institution is managed by ladies of position and wealth. Artists are interested in one way or another in these Clubs, and a few of the latter have painters who confine themselves almost entirely to the figure members of them also. They have their patrons, who are usually ladies of distinction in the society of the city; their officers and committees; and are quartered in old-fashioned residential houses in the art section of the town. Here the artist not only has the opportunity of selecting from a considerable number of female models,—the corporations being established for that sex exclusively,—but there, too, they have a costume department where costumes of many kinds may be rented at very reasonable rates. They appear to thrive well, and sometimes the social entertainments they give are quite enjoyable. Many models have been engaged by me from such sources, apart from those supplied by artists interested in my special work, and, as a rule, they are very satisfactory, having in most cases the additional advantage of possessing a genuine interest in their calling. Two or three of the illustrations to the present article are representative members of such Clubs,—the model shown in Figure 3 being one of them. Club models are very clannish in their way sometimes, and particularly those who associate themselves closely with the Club organization, that is those who daily patronize the

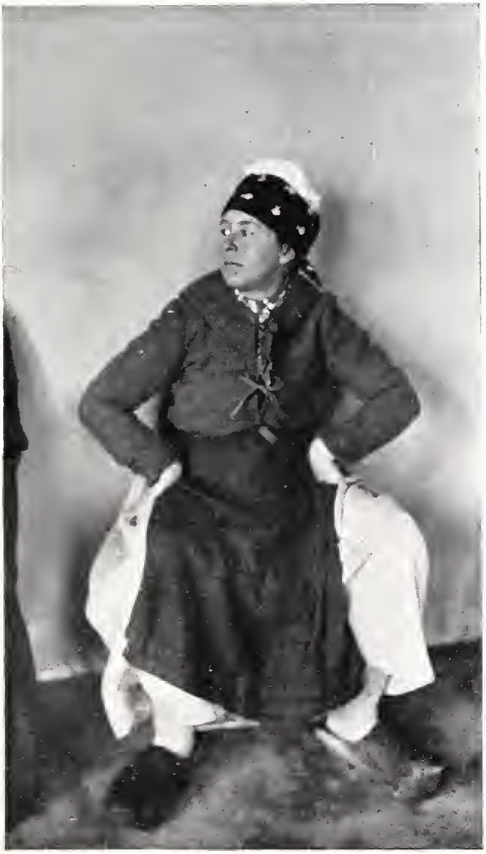


Fig. 3—A VETERAN MODEL. Photo by the Author.

lunch room, live close at hand, and are regularly employed by a certain set of artists. Of the class I have in mind, one never finds them posing at the "Life Class" in any of the city art schools, be they high, or much less, the elementary grades. If they pose elsewhere beyond the pale of legitimacy, they are usually of the *sub rosa* order of engagements, and not discussed among their acquaintances. I have yet to meet one, however, that ever makes the slightest objection to accepting an engagement with an art photographer of unquestionable standing and reputation. Indeed, as a matter of fact, they prefer engagements of this description, for the work required is far easier, less exacting; the remuneration, as a rule, much better, and the engagements are almost certain to make the model better known in very much less time. Indeed, as a matter of fact, if the models possess good claims to beauty, both of face and figure, they very soon come to know, that everything else being equal, and the art photographer who employs them all that he should be in his profession, educated, refined, and a good instructor, the chances are very much more in favor of their becoming skillful in the matter of posing than they otherwise would by confining themselves solely to the tuition of a painter in oils or water colors, to say nothing of sculptors. A moment's consideration is sufficient to convince one why this should be so, for with respect to beauty, luxuriance of hair, and all those other allurements that combine to make a more or less perfectly formed woman, with highly attractive features, the art photographer is unable to materially alter any of these in the pictures he produces. Faults in any of these particulars at once reveal themselves. Then when it comes to the posing it must be accomplished with great ease, rapidity, certainity, and classic grace for the art photographer, for exactly as the pose is made so will it appear in the photograph, whereas the tedium of the long and tiring poses made for the painters and sculptors, incline to make the model careless in time, wears many of them out physically, and predisposes to the assuming of rigid and hacknied attitudes. To be sure the achivements in these directions are often grand when completed, as the painter or sculptor can mold them, with his model before him, as he pleases,— but, oh, the poor model, she is truly a martyr in the cause, and how few outside of the studio are aware of all that she has endured. I have had models come to me time and time again shortly after they had completed a sitting for an artist and they have been so exhausted as to be totally unfitted to accept an engagement at that time.

In my forthcoming work on the "Studies of the Human Form," I have devoted not a little space to the education of the art photographer's model, and the art in general. This might naturally have been expected, as photography, when properly applied, plays so large a part in figure study of all kinds and in every part of the world.

There are still several other sources from which models may be obtained here in New York City, and they are of an entirely different nature. For example, in some of the largest daily newspapers we may at any time notice a dozen or more advertisements inserted by persons offering their services as models, stating that they are willing to pose, sometimes only for the head and shoulders, sometimes for the "altogether," for professional artists, photographers, amateurs and others. The majority of these claim to have their own studios, others prefer to go to the studio of the artist, and some are willing to take more or less extended engagements in the country during the

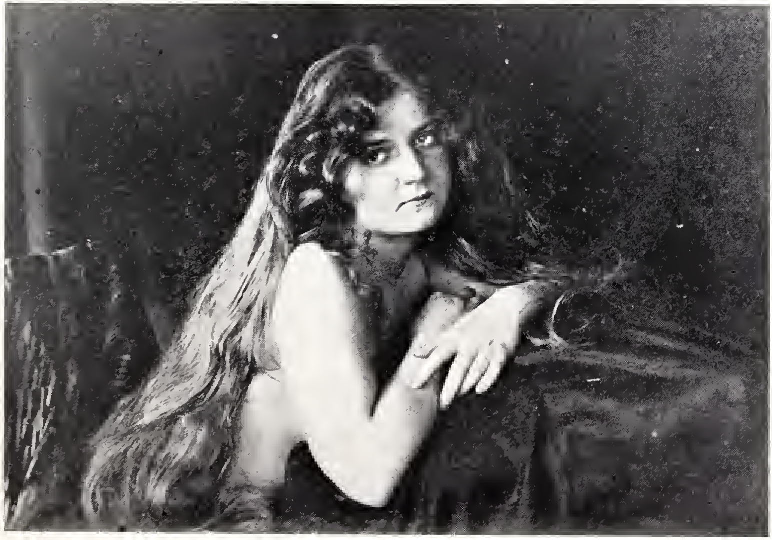
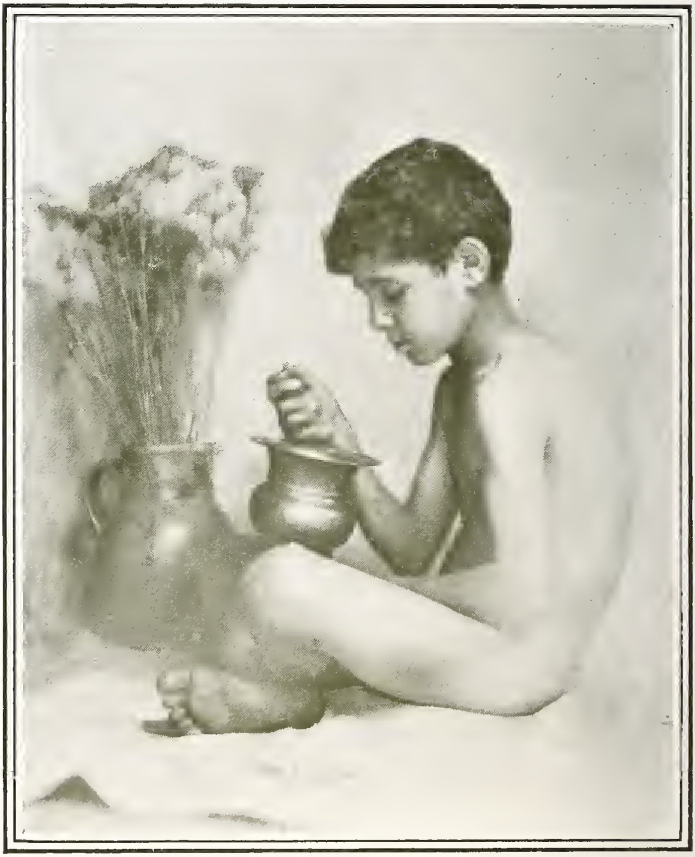


Fig. 4—A Great Favorite. Photo by Dr. Shufeldt.

summer months. I find that the *New York Herald* is a paper that prints many such advertisements, especially in its Sunday issue. Upon several occasions, more as a matter of curiosity than anything else, I have corresponded with and seen models of this class, and sometimes we may meet with one, who may be of service to the art photographer, but as a rule, or at least in many instances, the reverse is the case, and for reasons that I need not explain, I would advise the student to seek his material elsewhere. However, seen from another standpoint, it is an interesting phase of our social organization to study, if one desires to become thoroughly informed in regard to all the "ins and outs," of his profession and the many curious sides it presents, and, too, the unlooked for manner in which it sometimes links in with other callings where least expected,—and callings quite foreign to the aims and aspirations of strict art. All this I let pass without further comment. Results of an entirely different character are arrived at when the photographer himself undertakes to advertise for the various types of models he needs in his work. My experience along such lines was, the first time it was tried, quite a surprise, not to say remarkable. Having need in my work of models of every description,—men. women, and children, of all classes, races, and conditions, I inserted a notice of my desiderata in an evening paper. The first mail brought me no fewer than forty-four answers to my advertisement, and others followed for the next few ensuing days. Those seeking the engagement represented all kinds of people imaginable, and the strange part of it was that the majority of them were excellent subjects and in every way satisfactory. Not a few of them had never posed before in their lives, and had never so much as seen the inside of a studio. Some would only pose for the head; others who had posed for medical men were only for the torso; others offered hands and feet; but the greater number were for the entire figure. A few professionals appeared among them while many others took very kindly to my instruction, and soon made valuable additions to my list. Others came from good families and were well educated and refined, and soon evinced an intelligent interest in my operations and requirements. Later on a number of them introduced me to their friends and relatives, who were likewise willing to pose, so that from an anthropological stand-



BOY WITH VASE
Mrs. J. E. Bennett

point this was especially advantageous, for it enabled me not only to study individual characteristics of topographical anatomy, but to intercompare the same with other members of the same family.

Taking, then, the vocation of the art photographer's model, big and large, it is by no means an unpleasant one, in fact it may be made quite the reverse when a young woman enters upon it in the proper spirit and she so conducts herself that her life comes to be all it should be. Although the remuneration may not be large, it often is sufficient for comfortable support, and everything else being equal, if the one so engaged is industrious, accommodating, pleasing in manner, thoroughly interested and fortunate it sometimes amounts to even more than that, and a saving can be made. Frequently it makes one many warm friends and admirers, and affords considerable time for study and self-improvement, I know personally all this to be the case for some of my best models have testified to it. Then it offers

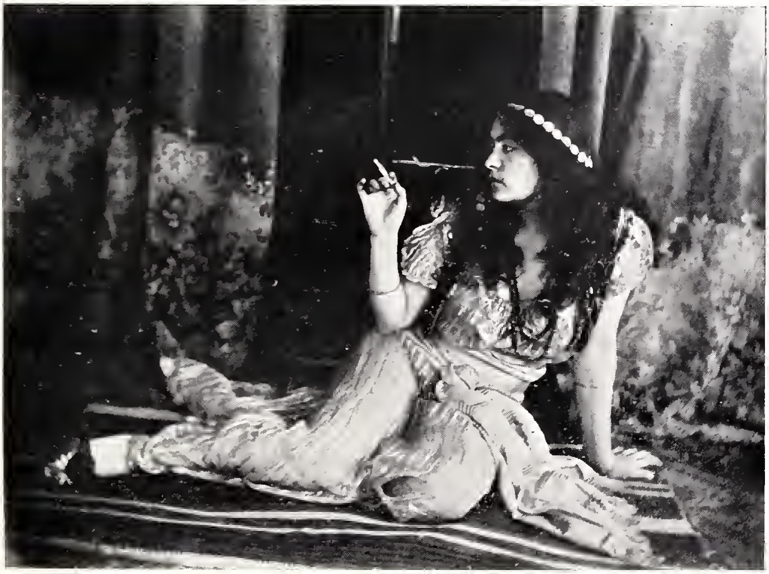


Fig. 5—An Inmate of the Harem. Photo by Dr. Shufeldt.
Posed for by Miss Amelia Rose.

a highly honorable career, for all is honorable that in any way redounds to the progress of art and education, and tends to make a people esteemed of the world, and surely the fine arts and all connected with their cultivation have this tendency if anything we do has. When I say this, I know that there are many in America who in no way agree with me, for they hold that it is money alone that makes the nation, and not brains and achievement in the arts and sciences. Such people, if they ever give the matter any thought, class our models with any but the respectable of the world's workers, and consider their calling absolutely disreputable. This is far, very far from the truth, and those who express such opinions are probably in many respects vastly inferior in real value to the models they so lightly regard and unthinkingly condemn.

One of the bright sides in the life of many models is the experiences they enjoy during the summer engagements with the art photographer. This is his especial field, for so far as the writer's knowledge carries him, he has yet to hear of a painter of these times who has painted from the nude female figure *en plein* air. Whereas, on the other hand, such studies are by no means rare, where the results are secured through the employment of the camera. Later on, I shall publish many of my own pictures obtained in this way, and they have already been favorably critised in many quarters, several of them having appeared in the *American Annual of Photography* and elsewhere. One of my most successful marine pictures of this character taken near New York City during the summer of 1904 is here reproduced in Figure 7.

These out of doors trips are generally highly enjoyed by all those models who may chance to be especially adapted to them. The open fields, the flowers, the surf, the travel and tramp, and even the danger all appeal to them, and for my own part, naturalist as I am, I am ready to confess that many a one of these outings I have enjoyed to the utmost, especially when my companion was of the right sort, in sympathy with the undertaking from start to finish, and bent on having a good time come what may, and even if no such a thing as a plate-holder slide was drawn the entire day, which, alas, has happened to me on such occasions more than once.

Passing now to the conclusion of my subject, I may say that our models are met with in still other ways not yet alluded to in this article. If the art photographer chance to be skillful in the handling of people, and thoroughly a man of affairs and possesses other necessary traits and qualifications, there are many he can secure by directly interviewing subjects who may strike his fancy wherever he may meet or even see them in public or elsewhere. Napoleon Sarony was very adroit and successful at this, and others have been and I have never met with any difficulty along similar lines, but this is too extensive a chapter to dilate upon here, although many of my personal experiences of this nature, did space admit of their being given, I believe, would be read with interest. One must be more than a good reader of character and an expert student of conditions to successfully undertake to do things of this sort, or sooner or later he may find himself placed in some very uncomfortable positions.

Finally, from time to time, we obtain fine art studies of the nude from a source totally different from any of the others thus far presented. When one has attained to a reputation more or less far-reaching, he may expect, sooner or later, to have women of wealth and high social position to privately visit his studio with the view to having the very best class of pictures taken of themselves in the undraped. These are curious requests and are invariably a matter of the strictest confidence between the lady and the artist. No permission is ever granted to use or exhibit these portraits in any way whatever, and very often the negative is demanded and handsomely paid for, as soon as a proof is made from it. Fashionable women often prize these pictures, and frequently they have them elegantly framed as gifts to their husbands as an addition to their dressing-tables. Ladies of the Court abroad and court favorites of important personages are sometimes the posers in such instances, and it is by no means a very uncommon thing for distinguished actresses to do this sort of a thing. Few are ever privileged to see them beyond the photographer who obtained them, as they pass forever into places beyond the ken and eyes of ordinary mortals, but a far greater number of such "studies" are in existence than most people know anything about.

Fig. 6—Bathed in Sun and Sea. Photo from life by Dr. Shufeldt.

Mist on the River. R. E. Weeks.

PRISCILLA. O. C. Conkling.

ADVANCED PHOTOGRAPHY AS A RECREATION.

By C. H. CLAUDY.

PHOTOGRAPHY as a recreation is preeminent among the people of this country—but in a degree of skill far less great than abroad. I do not mean that we have not our skillful workers—far from it—but that the average of good photographers here is lower than it is, for instance, in England.

This being the case, it seems to me that those whose influence is felt among camerists here should work to the end of greater technical skill rather than to the desired goal of artistic merit. I seem to be in a little minority of my own here—as nine out of every ten men who write of photography vociferate for the pictorial side of it. And I have personal knowledge of at least two pictorialists, whose names are big in the world of photographic art, who have no conception of how to make a decent technical negative and bright clean print, and whose successes are won entirely by a fine appreciation of what to do with their poor material.

Well, I am not a pictoralists, and couldn't be if I wanted to, I suppose, although I have periodical fits of picture making during which I bombard the jury with a lot of frames, some of which sometimes wriggle through. But I am not an artist, —the amount of study I have spent on art subjects wouldn't make me a very good bookkeeper if the subjects had been mathematics, and my only redeeming feature in my friend's, the art photographer's eyes, is that I have some idea of my own limitations. On the other hand, I know something about photography, with the art end left out. I believe I could come under the head of an advanced amateur unless some one wanted to call me a beginning professional—I won't quarrel with terms. At any rate I have a certain photographic ability and a certain output of plates and paper for pleasure only, and, as I don't aspire to be a Steichen or a Steiglits—knowing I couldn't,—I must do something else than continually hunt pictures.

I imagine there are others who have passed their photographic novitiae who are in the same position. What is there then for us to do with our cameras—we who have not the artistic bent, who yet love to make exposures and prints?

In the first place, we must learn to specialize. The general photographer may be happy but he is wasting a vast amount of time and trouble on very little. The question thus narrows down to what we shall specialize on. And here the field is very broad.

Myself, I specialize first on illustrative matter—for that is in line with my regular work, and next on pictures of unusual interest. I would walk ten miles to photograph a man diving from a baloon,—if I had no such pictures—where I wouldn't walk one for a lovely view. I would rather have a collection of a hundred pictures, each startling and interesting in its own way, than a thousand landscapes, even if they were all masterpieces.

But my own specialty is but one of great number. Some of you may be fond of architecture. Why not specialize on buildings, and bring out in your collection the reason and the law governing architectural conventions, and show to the casual, by successive pictures the difference between the good and the bad?

Nature offers a hundred photographic professions. There are stones and earth formations, flowers, trees and animals, birds, reptiles, and insects, and a score besides.

There is a speed photography, in itself rather a narrow specialty, I have always thought, although it yields to me some of the best pictures in my collection, but, byself, it has but few subjects. Yet these are not the easiest to get and a good collection means time and effort.

There is the study of the historical, and a wise and patient man is he who can and will use his camera for a preservative record of historical places and things which may change or be destroyed.

There is the possibility of adding some branch of science by comparative photographs of any thing which alters, a glacier. a flower, an animal. There is scientific photography using the term to denote the processes used with exact instruments for exact results—inclusive of that fascinating art photo micrography, and so on, and so on.

There is no reason why the expert, general photographer, a failure at true pictorial work, should lay down his tools for lack of congenial subjects—and there is every reason in the world why dozens of fine photographers, but very poor makers of pictures, should stop submitting horrors to editors with no more sense than to publish them, and devote their talents to something both useful and interesting. Think it over, some of you pictorialists whose art education is not over large in actual fact, however big it may be in pretense, and see if I am not right.

Sunlight in the Woods. William H. Zerbe.

The Mower. Chas. Vandervelde.

WINTER. R. E. Weeks.

PICTURE MAKING IN SAN FRANCISCO AFTER THE FIRE.

By EDGAR A. COHEN.

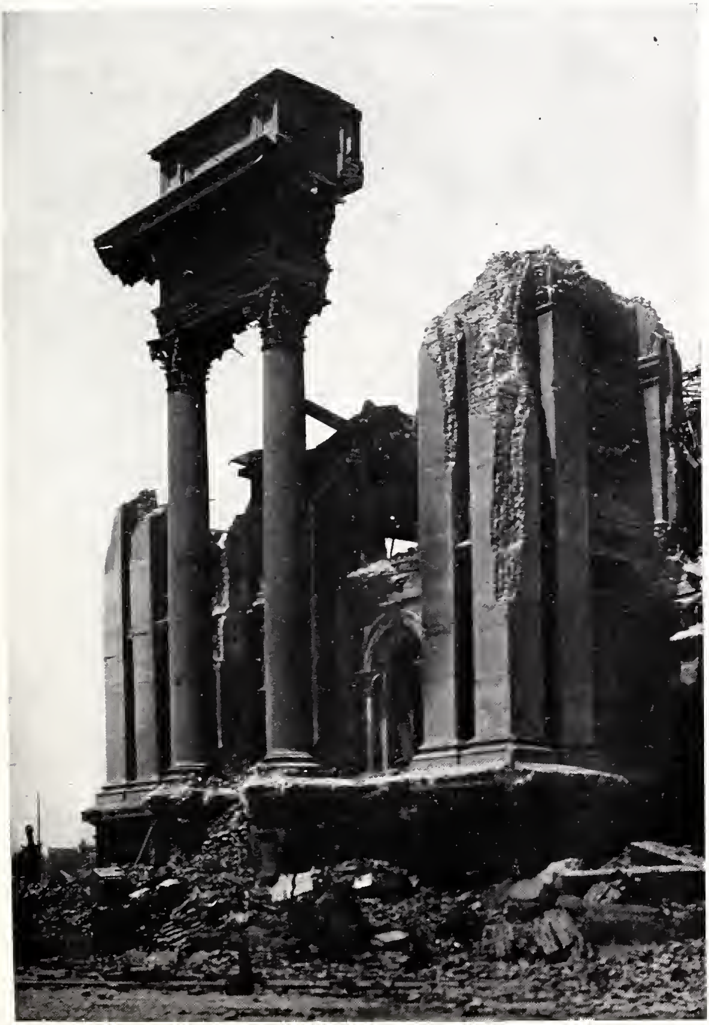
OCCASIONALLY trite remarks will refuse to be forgotten. Some years ago I heard a well known photographer say: "Mt. Tamalpais is the graveyard of photography. More cameras go up and fewer pictures come down than anywhere else in the world." The palm, however, must be yielded to San Francisco, for the period covered by the great fire of April eighteenth, and the succeeding weeks.

Not many cameras were at work while the city was burning, for people were too busy, saving their own and their friends' effects, to make more than a few snaps.

Hardly any pictures show actual flames, as the military herded people away from the advancing fire. Nor are smoke pictures plentiful. It was a grand sight—literally a pillar of smoke by day and a pillar of fire by night—but people were so appalled and benumbed by the extent of the catastrophy that most owners of cameras had not the heart to use them, thereby missing the chance of their lives.

A flood of people from suburban towns and nearby cities, desiring entrance to San Francisco, were turned back by the authorities, who, having neither food nor water for those within their own limits, were hurrying them away to places where they could be cared for.

When the fire was under control cameras began to multiply. Residents began to waken up; and outsiders with a pull, or who could show urgent business reasons, were granted passes. Everyone who had a camera used it to the extent of all the supplies he could procure. Then the bars were let down, and there were swarms of photographers. They came from all



Portion of City Hall.

over California, and from many other States as well; and as a rule they did poor work.

All conditions were adverse. At first it was smoky and windy; then rainy; and when occasionally the sun did shine, it blew a gale, so that a camera would not stand up on a tripod unless it were held. Clouds of smoke, ashes, dust, and powdered lime filled the air. The streets were filled with crowds of people picking their way through the debris. Time exposures were impossible; and only the lens that would work wide open, at a speed of 1/10 second or faster, gave more than occasional good results.

Corner of St. John's Church.

It is easy to forgive failures from natural causes, but with veritable flocks of fine subjects before them, it is hard to understand how people with cameras could pass them by, and portray only ruins and desolation. A composition must have artistic merit, before it can have more than passing commercial

Doorway of Sloss Residence.

value. This does not seem to have been understood by those making pictures for the purpose of selling. Their aim seemed to be to get in each exposure as many ruins as possible.

Generally amateurs displayed better judgment than professionals in selecting subjects; and I am inclined to think, too, that their technical work has been fully as good, and often better. Of course, the aim of the professional was to get his pictures on the market as soon as possible, and with over 75 per cent. of the supplies destroyed, he had to use whatever he could get. Still, in out of door work, the amateur makes a practice of hunting for interesting and artistic subjects. He does it for love, and having his heart in it, is the more likely of the two to be successful.

Every kind of a picture making instrument from a brownie to a kinetescope was in evidence. The pinhole man was in his glory. He was a class by himself, as he could give all the time he wanted, provided he could keep people away from the front of his box.

Watching the Fire from Nob Hill.

Things were changing all the time, and no one man could cover all the ground. Streets were blocked with debris, and the burnt district was counted not by acres, but by square miles. Dangerous walls were being dynamited, though usually the high wind leveled them. One would see a good subject on which the lighting was wrong, and would pass it, intending to return and take it under proper conditions; but on his next visit often found it had disappeared.

The various phases of human nature, displayed during the fire, offered the best chance for genre picture that it will ever be my fortune to see. People were moving their effects in any way they could, and many were burying what they could not take. Express wagons were at a premium; and every baby carriage and child's toy wagon had its load. I started from the house of a relative leading a stray horse I had caught. He was attached by a rope harness to a bedroom couch, on which were tied several hundred pounds of stuff. Under it were only common furniture rollers, but I engineered it three miles to safety.

Mission Dolores.

After the fire was under control, the debris burned for days, and in spots even for weeks, so that in developing negatives high lights had to be carefully nursed, to keep pictures from looking like fog scenes.

There was so much good picture material as to be almost confusing. There were all kinds of architectural effects, and had they been set among trees and grass, instead of having neighbors of their own kind, they might readily have been mistaken for old European ruins.

I do not know how others felt, but I became so interested in making pictures of what was before me, that my losses from the fire were relegated to the background. At least the negatives it had taken me years to collect were safe, and I knew I could make my living selling prints from them, so I went ahead with a brighter spirit, thankful for that much good fortune. I wanted some pictures showing how the skyscrapers withstood the fire, and some general views; after that views of what had been the best known buildings; all the artistic ruins I could find; and finally anything that would make either interesting or artistic results. In other words, I made up my mind that I wanted my work to count as an investment; that the subjects must be of sufficient merit to attract attention, even after the interest in the San Francisco calamity had died out.

There were fine bits of the City Hall, and the ruins of some score of churches. Most of them had been ugly as a whole; but earthquake and fire had both done their work on them, and now whatever of good there might be in their lines stood out.

The artistic parts of churches, public buildings and residences, required treatment, each by itself. Most workers photographed the whole, intending later to make either bromide or negative enlargements of the best parts. They made trial prints, which were of course lacking in interest, and then put away the negatives for future treatment. Now this is not the best method, because they have nothing to show for their work, and may never have at once the time and inclination to finish it.

With me photography is more than a business. It is at the same time my pleasure and amusement. It is so fascinating, that I am never satisfied till I have seen the finished result, and know whether my anticipations have been realized. The quickest way of getting it is the best, and for that reason I always try to fill my plate with just the desirable portion of what I see before me. This is not always easy, and requires not only a bellows with a long draw, but several lenses of different focal lengths. With their various combinations, almost any perspective is obtainable. Unfortunately this treatment is not open to the user of roll films, because neither scale or finder is of any use, and there must be a ground glass in which to focus, so that one may know which part to soften and which to sharpen. It was to allow him to get such results, that the film pack was put on the market. It is not as convenient to carry perhaps as the roll, but he must remember that one perfect picture gives more pleasure, profit, and reputation, 'than dozens of mediocre ones.

I do not think the relative destruction by earthquake and fire is understood in other States. The earthquake did less than 10 per cent., and had it not broken the water mains, where they crossed a marsh in another county, the fire would have been easily subdued, and San Francisco would be doing business today as usual. In the unburned portion of the residence district, buildings set on proper foundations had most of their chimneys broken off close to the roof, but suffered little other damage. Householders were required to do their cooking in the streets, till the renewal of the water supply, and until chimneys could be repaired and flues tested. This made a fine field for the camera, but was generally overlooked.

Doorway of Fowne House.

Churches and other very high buildings, that were not properly tied together, suffered severely, while the modern skyscraper lost only some of its cornices in the shake. The loss of life came mostly in the tenement and cheap lodging house districts, from the cornices of high buildings crashing through lower ones beside them.

On made ground, where proper foundations were made, the damage was slight; but there are several small selections, originally swamps, which were reclaimed, and later purchased by laboring men for homes because of their cheapness. Here they put up small houses, without finding any bottom on which to anchor foundations, and as a result their homes are twisted all out of shape. Everyone photographed these.

The architecture of the old Spanish Missions, built in the latter part of the Eighteenth Century is beautiful; and I have always been sorry that the Catholics substituted the Gothic in their later edifices. In San Francisco is the Mission Dolores. The old building is of adobe, and stands uninjured. The new structure of red brick beside it, and towering above it, was so badly cracked that they are taking it down. On the other side of the old Mission, and under the shadow of its eves, lies buried Don Luis Antonio Argüello, first Spanish Governor of Upper California. The earthquake played havoc with his monument. The top of the shaft poked through the wall of the Mission, and the bottom rests on the edge of the pedestal. In other cemeteries, too, many shafts are laid low; and the thought is caused, that some of our early citizens are dissatisfied with their quarters, and have been trying to get out.

Moving from the Fire.

Pictorially, the make-shift houses erected by the poor are worthy of attention; and why they have been neglected, I cannot understand. These people seem to have been actuated by the instinct that causes a cat to remain where he formerly lived, even after his home has gone. Sufficient tents were not available for all the homeless, who elected to remain in San Francisco, so they gathered together enough timber and iron for a frame, and covered it with tin and corrugated iron rooffing from the burned buildings. To them were furnished supplies of food, clothes, bedding, etc., so that they have been in clover, while the real suffering has come to those formerly in moderate circumstances, whose all has been swept away, and who are too proud to get into the bread line.

I think professional photographers are a happy-go-lucky lot, as truly Bohemian as the newspaper men or the artists of the brush, and as most of them were minus everything, except the knowledge of their craft, they were up against it hard. Several of them came to me, and I helped them out with cameras, trays, etc., and turned them loose on an unsuspecting public. I know of a case where seven of them joined forces. There were three cameras, a well equipped darkroom and just enough money and credit to gather in the requisite supplies from brother photographers in other parts of the State. Then began an unique campaign. They made pictures galore of anything and everything. They turned out prints as fast as they could. One of them was the business agent of the outfit. He employed people to take the pictures around and sell them from house to house, on the ferryboats, in public places, and in neighboring

Cooking Lunch.

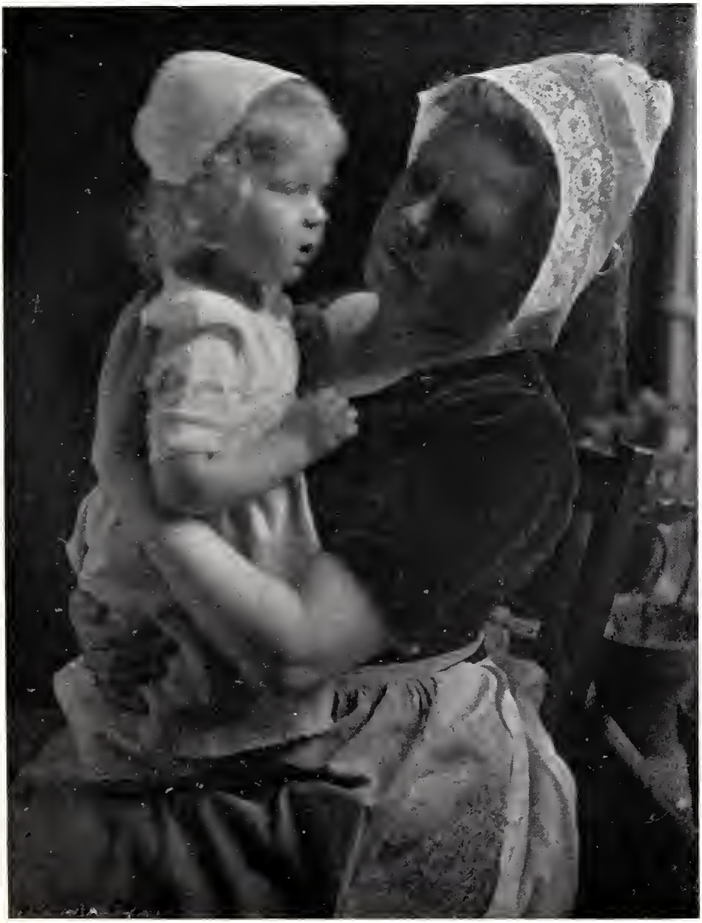
towns. And it paid. Everyone wanted some pictures to send away, and anything did for the moment. This information was given me by one of them about a month after the fire. He showed me over $500 in gold, which he said was his share of the spoils. He said: "We have made our killing, but our day is over. The pictures were all poor, and now people want something good, or they will not buy. I cannot blame them. The supplies we had were mostly of age, and we spotted neither plates nor prints. We did not name the subject, because after the prints were made we were unable to locate most of them."

There were plenty of individauls who pursued the same lines on a smaller scale; but their day, too, is over.

Lots of things that would otherwise still make good subjects have been spoiled by the advertising agent plastering signs all over them. There is still a chance for the good worker, but the crop is mostly harvested.

Perhaps 3 per cent. of the pictures taken in San Francisco are meritorious enough to survive.

The Most Pretentious Residence South of Market.



MOTHER AND CHILD. Helen W. Cooke.

HOME FROM TOWN. Belle Johnson.

THE CAMERA AND CIVIC BETTERMENT.

By C. M. GILES.

IT is undoubtedly a fact, as has been claimed by numerous writers, that there has in recent years been a rapidly growing love of beauty in all its forms in this country and also a growing ability to discriminate among objects more or less beautiful. It is also quite certain that the widespread use of the camera has had a large and commendable part in promoting this very desirable change for the better. While there is naturally much that is crude, and some that is worse, in the vast amount of photographing constantly being done the results as a whole cannot but have a strong influence in elevating the ideals of the users of the camera and their intimate friends. Among the other results camera users by the thousand have been annoyed and disgusted by having otherwise fine views ruined by the obtrusive presence of ugly advertising displays, telephone and trolley poles and other evidences of how the modern money mania leads to the defacement of so many of our beauty spots. Among the other evidences of and helpers in this growth of a love of beauty are the many "Civic Betterment Clubs" which are striving to assist in creating the "Homes Beautiful" and "Cities Beautiful" and have accomplished fine results in many localities. They are trying to eliminate the ugly and defacing parts, and enlarge, add to and improve the beauty spots, wherever possible. In this work the camera has taken a place in the front ranks. "Before and after" views are taken and published in magazines and newspapers and lantern slides are used effectively. By these and other means much has already been acomplished, but it is only a faint suggestion of the great work that might be, ought to be, yes, must be done! A great patriotic opportunity, and hence a duty, rests upon the devotees of the camera, and especially of members of the clubs, to help in this crusade, for such it is becoming. Views of places that are ugly and can be improved, of those that nature has made attractive and man in his greed has defaced, of what has been accomplished, and any other that will bring the public to a quickened sense of present conditions and the possibilities of future improvement will be helpful. The enterprising part of the local papers, which are in the great majority, will gladly co-operate in the movement if opportunity is given. Unfortunately, I, as yet, know of the work of the clubs only as I read of them in various periodicals, but I hope in the near future to get in touch with the work, and so know more of its possibilities. The American Civic Association, North American Building, Philadelphia, is the headquarters of the work, I believe, and this organization has already collected a large number of views and slides bearing on the subject. I would suggest that all camera enthusiasts and clubs should get in touch with this organization with which they necessarily have so much in common. Every possessor of a camera should try to assist the good cause and all will profit by the results. The splendid work that has already been done in some localities is only the forerunner and prophet of what is to come, if we live up to our opportunities.

EVENING ON MOBILE BAY. Arthur M. Dealy.

After School. G. C. Elmberger.

A COUNTRY ROAD. C. A. Reitzel.

HUNTING PORTRAITS VERSUS SPORTING PICTURES.

By JOHN BOYD.

EVERYONE who operates a camera, and who believes that he understands what it can accomplish, as well as what will make an interesting picture, is some time or other at a loss how to act when an "upstart" or a "would be" begins to tell him what to do, and how to do it. Take for instance the camerist with a hunting or fishing party. He knows that when an individual shoots a deer, bags a partridge, lands a salmon, or does anything else he considers should be perpetuated in undying platinum, he forthwith stands erect, places his rod or gun across his arms, hangs up his fish or game in an equally conspicuous location, and tells you to "let 'er go."

This is all very interesting to John Sportsman, the aforesaid, but who else wants to see the result? What do you think he would say were you to refuse to take his photo in that position, and tell him that the only proper way is for him to turn his face away from the camera, and assume a "make believe" posture, wholly for the reason that a genre composition is required, that you may win glory, medals, diplomas, and such like ornaments.

Unless he is a very dear friend, and has some scraps of art microbes floating through his system, he will tell you to go to Jericho, and find someone else who wants the back of his neck taken.

What are you to do? A rational plan would be to make two negatives—one to please your subject, the other to win glory with.

If you are after the ducats, Mr. Sportsman will place orders galore for the one that suits him, and the editor of this or other journals will accept and pay handsomely for the other, if it suits *him*.

Partridge for Supper.

A group photograph is a hard proposition, and I suppose ever will be. The only assistance one gets from the critics deals with phases that mean little to the average individual.

Here are a group of hunters with their Indian guides. They want a photograph showing them around the camp fire. We tell them it can be done, but explain the technical difficulties that have to be overcome, and finish by asking which one will sit between the fire and the camera. There is no answer. It is a case of getting a photograph, with a each and all of them facing the lens, a sort of a "that's me" looking right at you. Oh, Vanity, Vanity! We don't say so, but we think a whole lot along these lines. We finally realize that to get over the difficulty, we will have to take the supposedly subordinate position ourselves, even if we have to go to a lot of trouble to arrange all the contrivances necessary to open the lens, flash the magnesium, and lastly close the shutter.

On another occasion, a fine string of grouse was shot by one of the Nimrods, and as a sequence, his "picture had to be took." "How would you like it?" I asked. "Oh, I'm not particular—this way I guess," and concluding the action should follow the word, he assumes the "Big hunter I" style of position. Just as I thought I was up against it, a partridge flew across in front of the camp, and I at once suggested that he add it to his bunch, at the same time gathering my outfit, and following him up.

He dropped the bird, and going into the scrub to pick it up, the suitableness of the occurence suggested a subject. I made my exposure as here shown, after promising that later on I would make another to include himself, and his string of partridge.

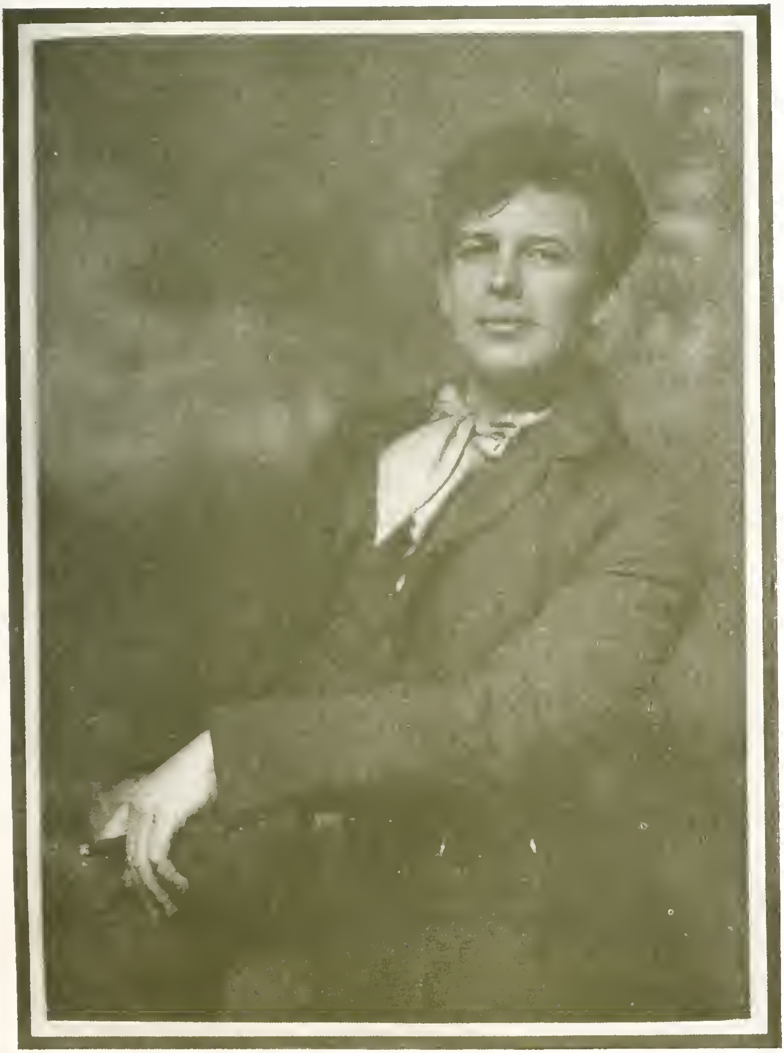
The telling of these incidents are intended to show how advantage has to be taken of every occasion that will turn a mere portrait into an interesting picture, and also to point out to the camerist the necessity of embracing every opportunity of turning out a picture that will not be looked on by the participants alone, as recalling some event, but rather that everyone who sees it, will feel that it is of general interest.

Another very important help to those who are sometimes at a loss how to arrange their composition, is a pocket memorandum book. This should be carried at all times, and copious notes made of anything that suggests itself for picture making. I have some ideas that were first recorded nearly twenty years ago that are not yet realized, but I am still looking for the opportunities, feeling that they will yet come.

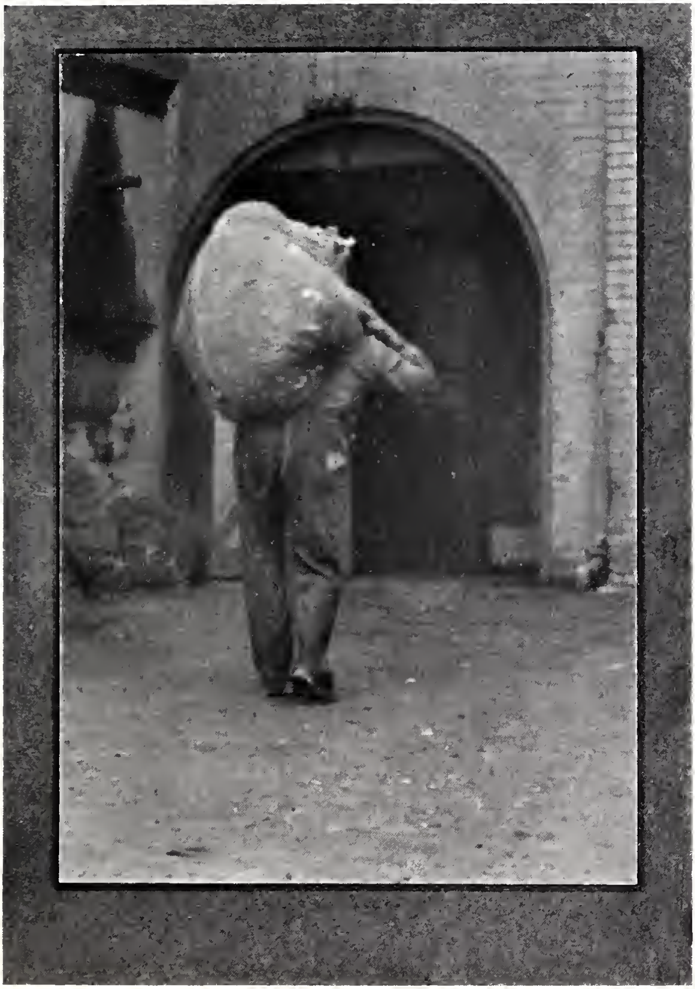
Before I go on any trip, I think over what subjects are likely to present themselves, making notes of these as they occur to me from time to time. Later on, I endeavor to work them into tangible shape with the material available.

In this way more is done than would otherwise be accomplished, and one will have fewer regrets over lost opportunities, for in this, as well as in many other phases of life, an ounce of foresight is easily worth a ton of hindsight.

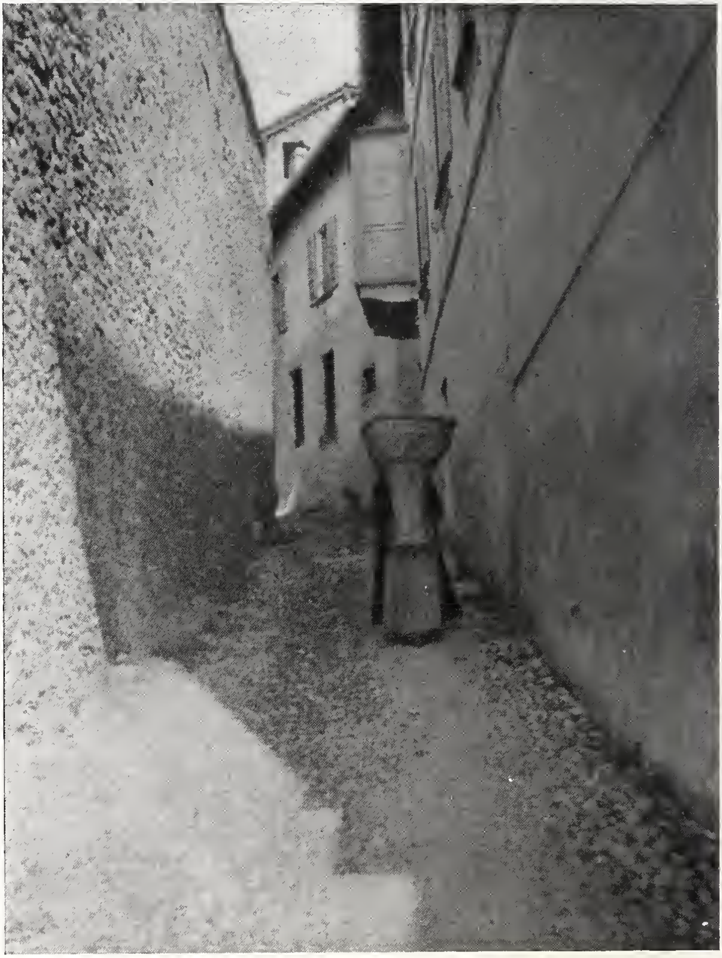
"WHERE THE TALES OF THE HUNT ARE TOLD O'ER AND O'ER."



PORTRAIT
Geo. K. Muntz



THE OLD COTTON CARRIER. Paul R. Morrison.



THE SHADOW. J. Whitall Nicholson.

THE CARBON PROCESS.

By GEORGE F. HOLMAN.

THERE seems to be a general impression among amateur photographers, who have not attempted carbon printing, that the process is very difficult and also expensive. On the contrary, it is no more expensive than any other first-class printing process and it is very simple and easy to do, but it requires care and attention to the few details, and the skill which comes with practice.

The carbon is the highest type of print and has been ever since its development many years ago; everything that is good in the negative is brought out to a greater degree than by any other process. It received its name for the reason that the tissue was originally made with Chinese ink or lampblack, each being practically pure carbon, and the prints were absolutely permanent. It was but a step from black to color, and now we have our choice of over forty tints, and all of these colors are practically permanent—water color and oil paintings fade.

The printed instructions which come with the tissues made by the Rotograph Company and the Autotype Company are simple and good, and their tissues are excellent. The tissues made by the Elliot Company will do for very contrasty negatives. These three are the only brands to be had in this country, so far as the author of this article knows.

The single transfer process is simple and the double transfer is rarely necessary. Most pictures are all right reversed, but when this is impracticable it is a very easy matter to make a reversed negative.

Toned prints are not permanent; and many a good picture has been turned down because it did not look good in black, or the so-called Sepia, while it would have been beautiful in some color adapted to the scene.

A spring or summer scene in brown looks unnatural. Leaves on an ordinary tree are never brown unless the tree has been injured by heat or is dead. Try tissue of a green tint that will match the green of nature as nearly as possible; the result will be surprising. No matter how many prints are made, the tissue by the same name or number will always give the same tint, a feature which is sadly lacking in toned prints.

Brown tones are easiest to work; some blues, greens, and blacks, hardest. Sepia is the easiest of all and best for timid beginners.

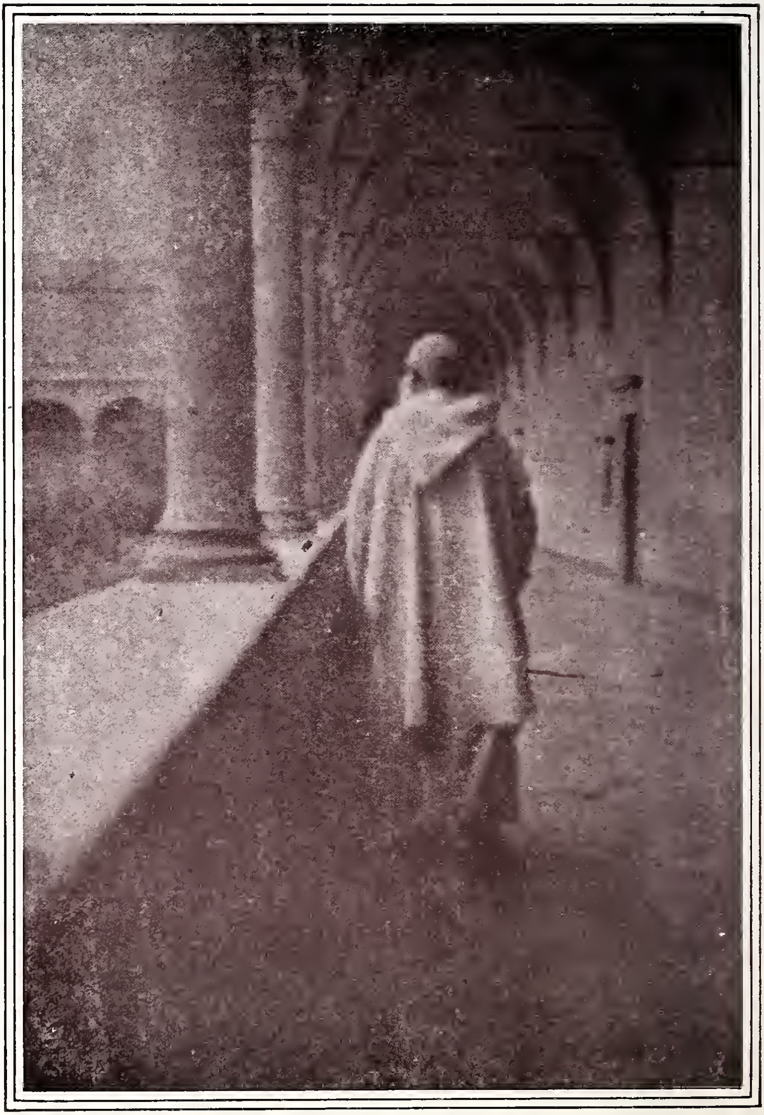
The professional photographer always exhibits his best work in carbon, if possible.

When a new photographic paper is placed on the market, it is almost invariably heralded as having in some way the effect of carbon, which all goes to show the wonderful artistic properties of this process.

The beauty of a carbon print is worth all the trouble, if it is considered trouble, of making it. Better have one good picture to show your friends than a dozen common ones to give them.

There is a process known as Gum-Bichromate which for some effects is superior to carbon, but that process is only for the photographic artist. The carbon process is for everybody—nearly.

UNDER A MOTHER'S WATCHFUL EYE. Harry Goode.



THE CLOISTER
J. Whitall Nicholson

PORTENSE D'EAU. A. G. Gimeno.

At the Window. Helen W. Cooke.

WITH A CAMERA IN FRENCH CANADA.

By W. O. HAMMOND.

IT is the custom, and one might almost say the weakness of artists from the American continent to wander to the quaint scenes of the old world in search of subjects with which to tempt the picture buyer. There is in art as in other fields the truism that far-away fields look green. Dutch windmills and Venetian canals are even popular in photographic magazines.

My desire is merely to draw attention to a nearby field for the pictorial photographer,—rural life in the Province of Quebec, Canada. In speaking of it as near, I have in mind nearness to the eastern States, for the city of Quebec is less than twelve hours from New York city.

The Province of Quebec, though a loyal branch of a British colony is the most considerable area north of Mexico where the English language is relegated to second place, and where an outsider may, by going a few miles from the cities, find himself at sea unless he can speak the French tongue. It is a land peopled by the hardy pioneers from Normandy and Brittanny after Jacques Cartier sailed up the St. Lawrence in 1534. The city of Quebec dates back to 1608, and has thus a considerable start of the doings at Plymouth Rock in 1620.

The early settlers were accompanied by self-sacrificing Jesuit priests. Their influence has left an element of piety and devotion among the people to this day, which is not equalled elsewhere on the continent. The preservation of the French language and civil code, which is founded on the Custom of Paris, has placed a social barrier between the people of Quebec and the rest of Canada which one cannot help regretting, except from the standpoint, that it has preserved a wholesome people, living the simple life in a homely, picturesque way. It is a setting which has been used by several novelists in recent years, with excellent effect, as in the various works of Gilbert Parker and in two or three delightful stories by W. D. Howells.

The St. Lawrence and its tributaries being the only avenues of communication, until a generation ago, settlement was formed only along the river banks. The farms extend from the river in strips which become ever narrower as the generations increase and the children each receive a slice from the paternal estate. As a result, the holdings are now ribbands, and no small faction of the total area is given over to fences. One of the French Canadian farmer's virtues is thrift, and it is amazing how he can live on a plot that would barely satisfy a western farmer for a barnyard.

Cleanliness is next to Godliness.

A general impression of French Canada may be had from the St. Lawrence River, and one cannot wish for a more delight-

The Sower.

Market Scene—French Canada.

ful outing than a sail down its broad bosom. Commencing, say at Montreal, one is in Canada's largest city, throbbing with intense industrial and pleasure-seeking life. A few miles west of Montreal is Lachine, made famous as the temporary home of La Salle, and the point from which he started for the west in 1669, on the journey which resulted in his discovery, or at all events exploration of the Mississippi. Descending the river from Montreal, one is at once in rural Quebec, where the farmers live a peaceful and uneventful life, judged by the average western standard, and enjoy customs and peace of mind that the restless commercial world might envy. Living in a complex social age, they yet produce many of their own necessities, such as woolens, blankets and coarse boots, which other people buy or import. Their tobacco may not take a place alongside that of Virginia or Cuba, but they grow it in their own garden, they smoke it all day long, and they sell it in

Small Loads make More Rides.

the city markets to their urban brothers. Other farming races have long since resorted to two-horse wagons, but in Quebec the one-horse cart is still popular. Loaded with a few hundredweight of hay it is a novel sight, and is somewhat suggestive of toy farming. Sowing grain by hand is still the rule rather than the exception, hence the farm implement agent cannot thrive here as he does in most parts of America. Hay is the largest crop of the French Canadian farmer. When the hay harvest arrives it is a busy time until the crop is safely in stack or under cover. The women of the family freely lend their aid, and become Maud Mullers on the summer landscapes working perhaps in the shadow of the parish church.

OLD WINDMILL.

The farms are so narrow and so numerous that there is continuous village life on both sides of the river from Montreal to Quebec, 175 miles. Every few miles a church spire lifts its head, the most prominent building in all the view. In this part of Quebec the Roman Catholic church has no rivals, and it is therefore wealthy and powerful. The cottages are largely of one architectural type. Their quaint dormer windows and curious gables are unique on this continent and are directly transplanted from old France. The scenery, however, is far from being monotonous. The winding roads, the overhanging trees and the vistas of the river make it a land of enchantment. The lavish use of whitewash on the exteriors of the cottages is a true index of cleanliness, and marks a continuous line of habitation, visible for many miles along the shore. Nearby inspection reveals old-fashioned flower gardens, vine-covered verandahs and often an outside stairway, quite fascinating to a touring photographer.

Here and there in the landscape stands an old stone windmill, a remnant of feudal days, when the *seigneur* ground all the grain for the *censitaires*, collecting therefor his legal toll, and when the tower was the refuge and fortification from the onslaught of the Indians.

That religious sentiment is strong is evidenced by the frequency of wayside shrines. These usually take the form of a wooden cross which provides a medium for devotion at any hour that a devout farmer may pass, who feels himself in need of consolation. One characteristic of the French Canadian farmer is that he cannot be charged with race suicide. As large families need plenty of bread, there is usually a bake-oven at the rear of the house, where bread is baked in sufficient quantities to sustain a vigorous family in this northern climate.

There are good highways and railways, but the river is still an important channel of traffic. The riverside farmer has his own boat. It is of a flat-bottomed type, called batteau, and its peculiar shape and brown sail make a picture for any artist. These family conveyances take loads of vegetables and other produce to the cities, and when their output joins that from the carts by land, it forms the basis of a market scene at Quebec or Montreal, most interesting to a visitor. The farmers make the market a place of activity the year around. In winter they bring maple syrup and maple sugar, and perhaps an odd calf or spring lamb. In summer there is an array of vegetables which shows the fertility of the St. Lawrence valley. To be sure, they run strong to onions and garlics, but these are in demand by their city brethern, as well as the vegatables which are less obtrusive in their nature. The strong, healthy, old French Canadian mother offers her spring herbs, her few pounds of butter and her maple sugar seemingly with equal interest, as it all brings money for the few necessities her own hands cannot supply, and at the same time reflects a picture of frugal life that city wastrels might imitate.

The visitor is cordially welcomed in French Canada. The habitant farmer may well surmise that you are not of his race, but he greets you with a cheery "*Bonjour,*" which makes you glad you came. During a visit of several days to the Cote de Beaupre, the oldest settled part of the Province, in the summer of 1905, I spent an ideal holiday, which I would gladly repeat almost every year of my life. I took many snapshots of farmers at work or travelling on the highway. They either posed readily—which I did not want in the sense of *posing*—or made it plain that my action was not resented by them. Few of them speak English, and as I could speak almost no French,

Maud Muller in French Canada.

our communication was limited, indeed. The farmer who appears in the photograph of "The Sower" was especially kind in his manner, and I have no doubt said kind words; but in this case, as in the others, our attitude towards one another had to be defined by gestures.

And so the life continues down the St. Lawrence to the Gulf. The City of Quebec is steeped in historical memories dear to Canadians, but which have no place in this article. Gradually the mantle of the past is being lifted. Tourist life injects new ideas, the factories of New England have for years attracted and returned many of the young people from the farms, and the indifference to the outside world is slowly pasing away. Still, for a long time the French Canadian farmer will be a type by himself, living a quiet life, indulging his simple pleasures, devoting himself to his family and to his church, and affording glimpses of an older civilization whose simplicity and picturesqueness is the marvel of every visitor.

A Street in Old Sillery.

At Break of Day. A. G. Gilman.

THE BROOK. R. E. Weeks.

WRITING FOR PUBLICATION.

By SPENCER HORD.

Former Editor American Annual and Photographic Times.

EVERY editor is constantly on the lookout for good, live, up-to-date matter to fill his columns. The demand for good stories is always greater than the supply, and any person whether known, or unknown, may rest assured of his story being read and considered if offered in presentable form.

To warrant consideration you must have a story to tell. Life is too short to either write or read glittering generalities. The readers of photographic journals in particular want, and need help, that is what they pay their dollars for. If you have devised a method for securing results in a simpler way than heretofore, if you have discovered something new and can tell how you do it, in good plain English, the editor reading your MSS. will rise up and call you blessed. Your article will be hurried into type in short order and the cashier instructed to send you a check. If you have a knowledge of art or composition and can impart such knowledge understandingly, you have a market for all you can write. But don't waste your time, and other people's unless you have something worth saying.

Fine writing is a secondary consideration with technical journals, if your story has meat in it, the editor will be willing to spend time in dressing it into shape, do not for a moment suppose that every article you see in print is just as submitted in manuscript, were this so there wouldn't be so many baldheaded editors.

In most instances an illustrated article will have preference, as the illustrations add to the attractiveness of the magazine's makeup. When it is necessary to illustrate a point by means of diagrams or sketches, rough ones will answer, as experienced draughtsmen and artists on the staff of the publication can redraw them properly. Naturally, if your diagrams or sketches are good, extra expense to the publisher is saved and will be credited to your account.

Always type write your story when possible. Write on one side of the sheet only, double or triple spaced, and leave a margin of at least one inch on each side for the editor's corrections or instructions to the printer. If the article is illustrated indorse the following in the upper left corner of first page "........... illustrations, titles and instructions on back."

Indicate in your text just where the cuts are to be placed by writing (Illustration No. — here. Title ——————.)

Solio prints are best for reproduction and should be mounted on plain white cards so the editor's instructions to the engraver may be plainly seen and read. Prints on Velox and some other papers will answer but engravers prefer the silver printing out papers. Never submit blue prints or prints very red in tone, as it is impossible to reproduce them by the half tone process. When your pictures have been copyrighted, endorse this on the face of the mount "Copyrighted by John Doe 189—," and just below it "Copyright waived to the publishers of the —————— Magazine," or permission to reproduce is granted to the ————Magazine." Mail the article and illustrations in a flat package, enclosing stamps for return, and be sure your name and address is on the MSS. and each print.

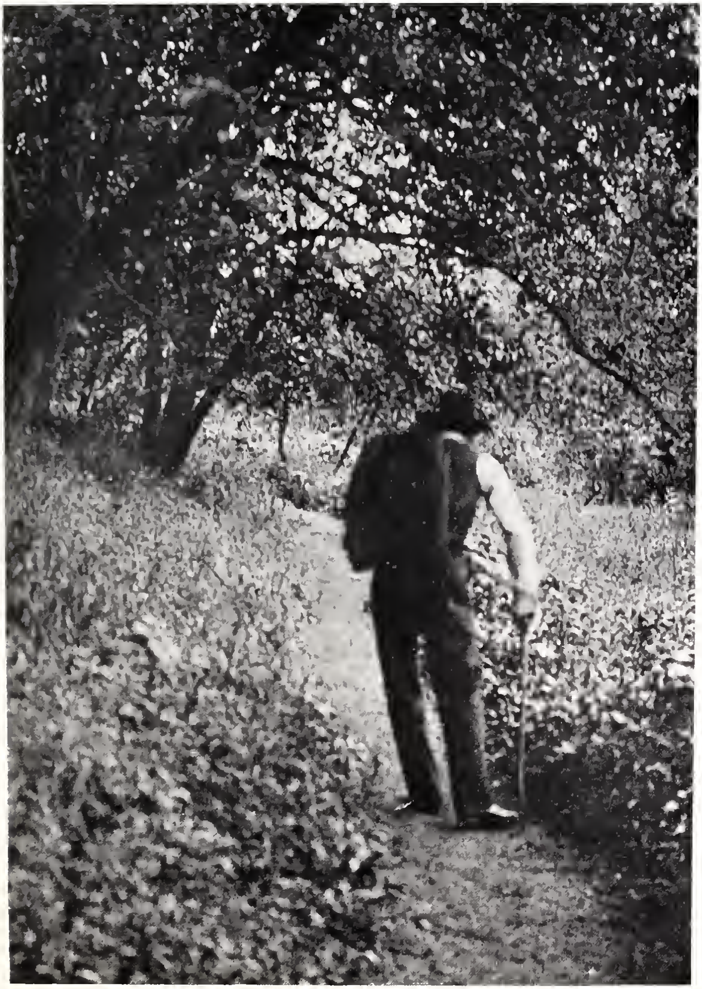
Some magazines pay on acceptance, others on publication, but if your story is seasonable you will not have to wait long for either acceptance or check. Always include a letter to the editor stating that you are submitting MSS. giving title, number of words and if illustrated the number and kind of illustrations; and last but not least the remuneration expected.

Do not be discouraged if your article is returned, as it may not be just suited to the clientele of the magazine. If, however, your story has been returned to you several times, just drop a line to the last Editor (big "E" this time), with a stamped envelope for reply (don't forget this) and ask his frank opinion as to its merits, and you may rest assured that he will tell you the truth, for if you *can* write, he needs you even if the article he just returned did not suit him, and he will usually suggest some topic that would prove acceptable.

As there is a decided scarcity of good writers on photographic subjects I trust these few suggestions will aid in starting some of you on a career brilliant and instructive, and afford the editorial scissors a long needed rest.

"GHOSTS." Dr. W. F. Zierath.

THE FOG. Dr. W. F. Zierath.



THE WANDERER. G. C. Elmberger.

AN HONEST PRICE SCALE.

By H. A. MARK.

WHILE volumes have been written to prove the photographer and artist, where is the writer brave enough to call him a good business man? Divide the business world into two classes—those with good busines principles, and those without—to which does the photographer belong? "Honesty is the pest policy" is the basis of business success. Between the sound business man, who follows this policy, and the grafter, who avoids it, are all grades and degrees; low down in the list is the photographic profession. Properly conducted, photography is, and can be made, an honorable calling, and there is no good reason why the photographer should not be a good business man.

Our profession is young and hardly a day in its history has it been free from the grafter. Its early life was almost entirely controlled by them; partly, because it was new and mysterious, and little knowledge or money was required to make one pass as proficient. After three quarters of a century the newness is wearing away, and with the amateur on every hand the "mysteries of photography" will soon be common property. With these conditions, the photographer, whether artist or no, should see that all practices of the grafter are left behind, and his feet planted on the rock of sound business principles. While remodeling in many ways is needed, what is more important than a new price scale?

The professional, the business photographer must live, his patronage must furnish him with an ample reward for his labors; and at the same time this should be justly proportioned among them, a condition far from true at the present time. In early days prices were not based on the cost of material or labor, but on the caprice of the operator or the novelty of the product. Then there was the itinerant tintyper, almost universally, a grafter pure and simple. At length the time came for him to fold his tent and leave the field to real photography.

In those days retouching was not practiced, and little artistic knowledge was required to gain success; neither were as costly appointments and fixtures required as now. In those "good old wet plate days" the negative was developed within five minutes from the time of the exposure. If it was "sharp" without "movement" the order was booked at once. Proofs not being shown there was no occasion to make additional sittings from which to choose. Then negatives cost less than now, print paper was about the same, and card stock much less. As a result a price of $3.00 and $5.00 by the dozen for carte and cabinet, respectively, made a good, profitable business. Then came the dark days of price cutting and the attempted reconstruction following. Raising prices is always a hard matter, and most workers found it easiest by fooling their customers with different surfaced papers and novel mounts. Since then the negative cost has been slowly increasing. Expensive retouching is now a necessity. The wet plate is supplanted by the constantly becoming more expensive dry plate; better apartments are required, more plates, time, and skill are used in making sittings; and customers are harder to please. To meet these added expenses the prices have had to be raised, and instead of doing this honestly the same old mount and paper dodge is still being used. Not only the photographers are using it, but what is worse, the paper and card stock manufacturers, and dealers are encouraging it.

Go into our brother photographer's studio and ask to "have our picture tooken" and this is what we will find: Several negatives will be made from which to choose. In most cases it will make no difference whether the order be all finished from one or from several of them. After we have seen the proofs and made our selection, if the negative be cabinet size, we can have a dozen mounted on alarm sized cards for $4.00. But should these same prints be mounted on 7x9 or 8x10 cards the cost will be $6.00. If the paper is changed from aristo to platinum the price will be raised to $7.00. If, instead of mounting this print on the card it is tacked to a folded piece of heavy wrapping paper—not cut, but torn from the roll—the cost will be $8.00. If we want to be in *style* we order our

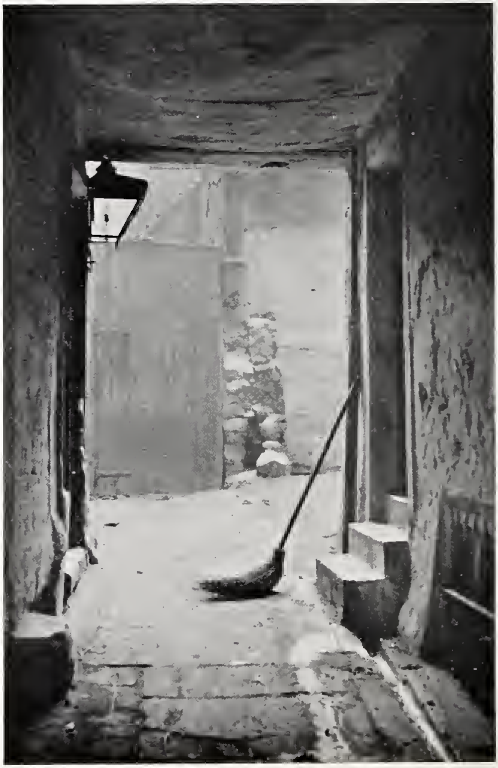
Over the Hill. Geo. K. Muntz.

prints to be on "backed" aristotype paper and pay $12.00 for them. If we were fashionable society people we would feel highly pleased with our purchase "because it cost a lot." But should we be an amateur photographer who was mounting views on "backed" paper we would feel $8.00 to be too much to pay for 50 cents worth of additional material and labor when, without the extra backing, $3.00 worth of time and material, together with skilled labor, could be had for $4.00.

Is this not a dishonest price scale? It is neither just to the photographer or his patrons. This price trick, this juggling with finishes and mounts, has served us well, but the people are "getting onto it." We must abandon it and do business in a business way or again have our profession classed with the grafters.

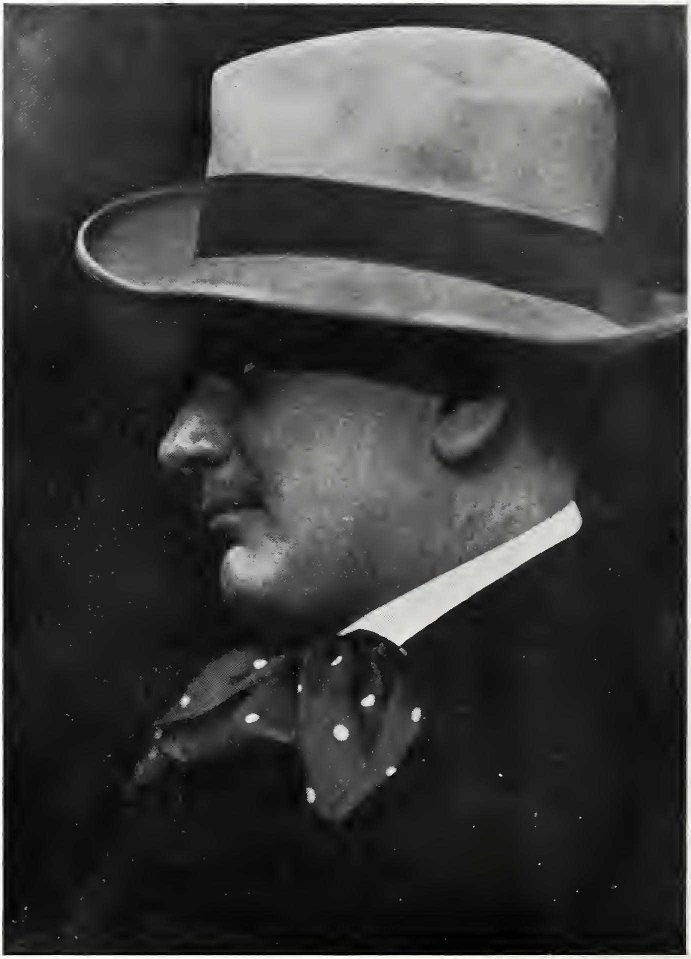
In wet plate days, with negatives little better than process plates, a price allowing $1.00 for the negative cost was not out of proportion. But to do the same thing now, and to try to make up on something else is far from right. Conditions have changed, and prices must change to meet them. If the photographer is an artist, as we claim him to be, he should have artist's pay for artist's work. By the time the negative is ready for the printer most of the real artistic work has been done, and from then on the cost is practically the same, regardless of the finish or mount, unless we expect carbon and gum work. In none of these common finishes does the cost vary to exceed $1.00. In the ordinary studio the artist's work is in the posing and lighting, development and retouching of the negative. In all sizes up to 8x10 the cost is practically the same except the different cost for plates. The same time, the same skill, the same instruments, the same appointments are used in either case. So, why not assess the cost where it belongs? Have a proper price for this, the artistic part of the work, and let the print paper and mount be a secondary matter. Charge the customer for the real work and let him have what he pays for. Give him the negative when he has paid for it and let him do his own printing if he so prefers. Some say "my customers will not stand for the change."

Your customer will stand for the change if you are the photographer you claim to be. If you are only a grafter do not disgrace the profession—quit! Had we started this years ago, doing business in a business way, the people would be educated to respect our skill and ability and we would, to-day, be standing on the high plain which artistic productions merit.

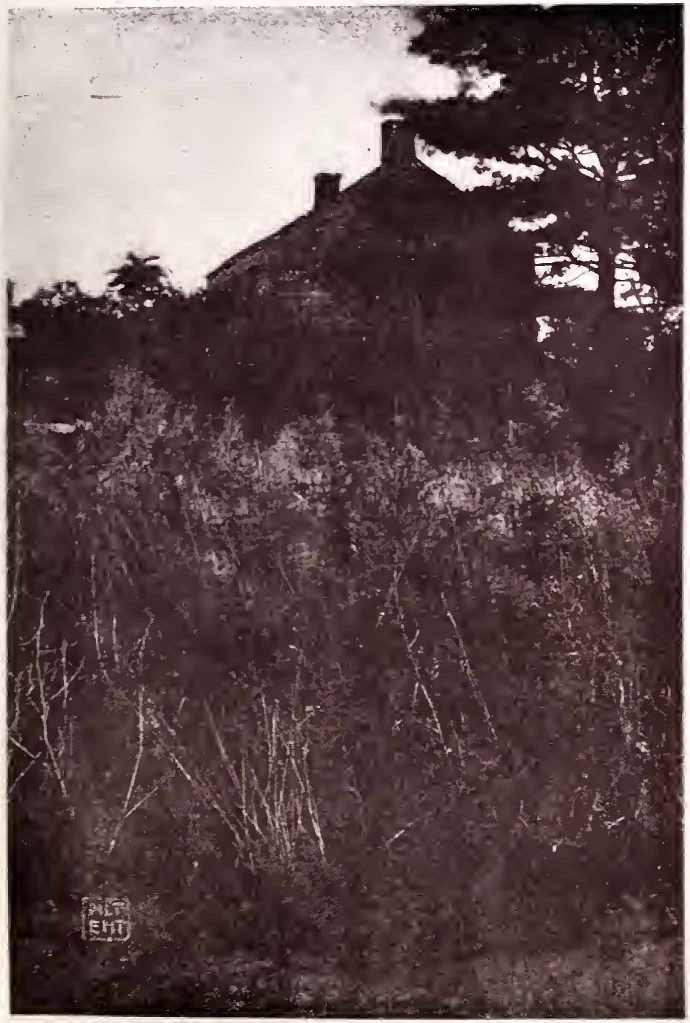


A Cul-de-Sac. A. W. Walburn.

HEAD OF A CHILD. Helen W. Cooke.



STUDY OF A HEAD. A. Dührkoop.



THE DESERTED HOUSE
Edith H. Tracy

OUTDOOR PHOTOGRAPHIC WORK FOR WINTER MONTHS.

By CHARLES M. KNIGHT.

AS the cold weather comes on, there is a probability that most amateurs will put the camera away in the closet not to be brought to the light until the longer, sunny days of spring are with us. Some are afraid of snow-fields and cold fingers, and doubtful of the ability to judge correctly of exposure, where contrasts are so marked and lights so variable, but the enthusiastic worker will not stop for these fears and difficulties and will be richly repaid for all his efforts. A great deal of outdoor work can be done in winter and some effects are better shown than in summer.

Of course snow-scenes demand first attention and, while these are often difficult to secure in a successful way, owing to the strong contrasts of black and white, a little experience will remove many seeming difficulties. Snow-scapes are best taken with the soft light of a cloudy sky,—the peculiar gray clouds immediately following a fall of snow give fine effects. If the sun is shining, choose late morning, or early evening light and work for the long shadows. Avoid large unbroken fields of snow in the foreground. If the view be that of a house with snow piled upon roof and topping railings and loading porch and veranda roofs, use the shrubbery, or a path, or road-way, to break the smooth monotony of the foreground.

A ravine, or forest glade, clad in winter snow, makes an attractive picture. Strive to include the rough bark of trees and, using a small stop and long time, bring out the slender lines of twigs, dark, against the white snow and sky. Move about until you bring a silvery colored tree, like a birch, against the dark, rich foliage of an evergreen. The beauty of tree-trunks is usually overlooked, and, indeed, they are so overshadowed by thick foliage in summer that their characteristics are not often secured,—besides, the strong sunshine gives patches of strong light which do not add to picturesque effects. The beauty of old trees lies in their rugged character; the rough bark of an oak or sycamore,—the soft gray of a beech, with its mottled covering of lichens, brown and yellow, or the gnarled and knotty trunks, with crooked lower limbs and wide-spreading roots of the older trees, growing on the border of a forest,—to be able to fix these on a photographic plate, is compensation for a long trip in the snow.

Or, again, select some fence corner, where the tawny seed-plumes of last season's golden-rod still stand, with the less graceful teazel or burdock to give character to the group—or, vary the view by including a patch of blackberry bushes, holding a bird's nest, running over with snow.

Did you ever try to make a picture of a swamp in winter? If not, you have missed a charming subject. Select a view of reeds, or "flags," in the foreground, and farther back, thick bushes bent beneath their load of snow, and, in the background, tall trunks of trees with their dark branches against a gray sky,—such a view cannot be obtained in summer, because the rank swamp-growth is too dark and heavy for the foreground, but in winter, only, the firmer growth stands and is set off by contrast against the snow, like lines in an etching.

Another attractive subject in winter is a small stream in a narrow valley that has dark, quiet pools,—some of these will be frozen and snow-clad, while others, where the water is quicker, will be open and dark. How black and cold the water looks, contrasted with the thick, fluffy snow, covering bushes and banks to the water's edge! Boulders, with snowcaps, thinning down to a veil about their sides,—fronds of the hardy Christmas fern, lying tenderly upon the soft snow, with rugged stumps and dark evergreens to break the otherwise monotonous white, give a rare effect.

Another class of winter scenes are those of a frost, or clinging snow, covering every twig with feathery crystals. To catch this gossamer beauty, one must be ready on the moment. The work of Dame Nature is done, usually in the night, and with the sunshine the beauty begins to vanish

Keep your holders loaded and begin work by eight o'clock or earlier, if the wind gives sign of despoiling this fairy scene.

Some views of a small city, or village, looking out over snow-clad roofs from some high point, are novel and interesting. *Harper's Weekly* has contained summer views of principal streets in Chicago and New York from roofs of high buildings, but such views, in winter, are more attractive. The snow covers the dark roof-tops which are varied by shapes of chimney, cupola and tower, and all set off by the darker sides of the buildings. The streets, too, can be followed,—a white ribbon, leading off between the dark gray of building walls.

It is curious what changes a covering of deep soft snow brings to a home door-yard. The novelty gives eager interest to such a picture. Hear Whittier sing in "Snow-bound:"

> "The old familiar sights of ours
>   Took marvelous shapes; strange domes and towers
> Rose up where sty or corn-crib stood
>   Or garden wall or belt of wood.
> A smooth white mound the brush pile showed,
>   A fenceless drift what once was road.
> The bridle-post an old man sat
>   With loose flung coat and high cocked hat.
> The well-curb had a Chinese roof;
>   And e'en the long sweep, high aloof,
> In its slant splender seemed to tell
>   Of Pisa's leaning miracle."

Some amateurs who have friends living in the country may be fortunate enough to make photographic studies of the farm barn with its near-by straw stack, about which, huddled in the snow, are cattle, or better still long-wooled sheep. Some of the natural groupings of animals in these homely scenes excels those that can be had in summer, because the cold drives them together. While in the country, get views of wood-choppers, cutting wood in a forest. The fallen trees,—the piles of freshly cut wood,—the brush of the tree-tops,—the teams and partly trodden snow, with the surrounding forest trees standing as mute witnesses of the havoc, make a combination that appeals to one's artistic sense.

The busy scene of a gang of men cutting ice on lake, or river, is worth several quick plates. The open water looks black and cold in contrast with the ice, but it reflects enough light to give every ripple on its glassy face.

Those who cannot go afield must look for material near-by. Try winter sports; get your boy and girl friends into a snowballing contest and catch the animated scene, or seek the head of a slide where some sleds are just starting down, others getting loaded and all faces are eager and happy. A group of boys, building a snow fort, or shaping a snow man, makes a novel view for a hand camera. Save a plate for an express train as it comes into a station after a heavy fall of snow, with its running gear loaded and clogged with drifts and fine, glistening crystals, covering its entire shape, as though it were shrouded in a misty veil.

These are only suggestions,—fill them out and add to them. Do not think outdoor camera work gone with Indian summer days. Keep your cameras at hand with holders loaded. Provide rubber boots and warm gloves and plan to spend several of your "off days" copying some of Nature's winter moods which, to most of us, are her rarest.

Portrait of H. L. Brainard. Elizabeth Holden.

SERIOUS READING. Hana Robison.

SOME ADDITIONS TO PASSEPARTOUT WORK,

By JAMES E. CALLAWAY, D.D. S.

WHILE many changes in mounting and framing have been noted in the past few years, it strikes me as curious that no alterations have been evident in passepartout work. Some description of the additions I have made to my own methods may be useful as a hint to further development of this pre-eminently simple process.

The passepartout, usually, consists of a cover-glass of the full size of the mat required. Now, most of us are possessed of many spoiled plates, of fine clear glass, but these are generally of the size of the picture we wish to frame, so no allowance for mat can be made. It occurred to me to frame a 4x5 print back of a 4x5 plate, binding as usual, with no mat, of course. In a piece of heavy mat board large enough to allow ample margin, I cut a hole a trifle smaller than the plate, but not small enough so the passepartout binding would be covered. The plate was then placed back of this opening, and fastened down with the ordinary binding. Then the cardboard frame was bound at the edge with appropriate color of binding. It was quite apparent that the heaviest part of this combination was the glass, so it was most practical to suspend the picture as usual from the card which backed the glass. Result, a 4x5 picture, with a frame of wide margin, yet using only a 4x5 glass.

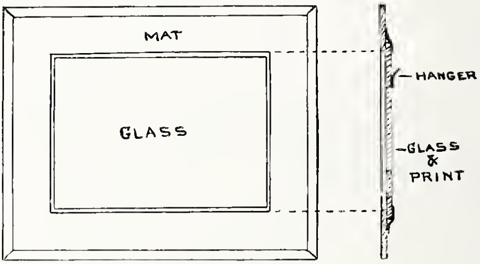
This method also adds to the apparent depth of the frame, by sinking the glass below the level of the mat. The binding of the glass itself, which binding we allow to show through the opening in the mat, may be gold or silver, or some suitable color to make a line between mat and print. This last, and the additional binding of the mat edge, allows great latitude for individual taste. Add to this the possibility of covering the mat with binders' cloth of colors suited to the prints, and you have nearly doubled the scope of the work.

IN '61.

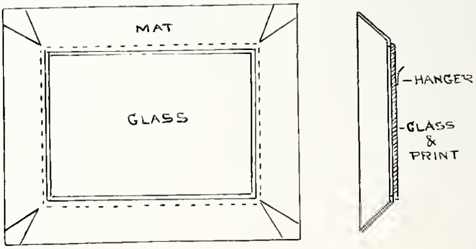
Geo. F. Holman.

So much for flat additions to your bound, glass covered print. If now you wish to make a frame of real depth, supported from the glass, proceed as follows: Cut a mat, and cut the hole for the glazed print, as usual. Notch each corner as shown in sketch, not approaching nearer than say 3-8 inch from opening of mat. It is plain that you must suit the size of notch to the case. Place a ruler ¼ inch from the opening, on each side in turn, and bend up the outer edges. Bind together on the back the edges which formed each notch, and you have a deep beveled frame. To the back of the opening fasten the picture. The bound edge and the inner binding line feature are applicable to this frame also.

FLAT FRAME.



DEEP BEVELED FRAME.



The two main principles which make these designs a success with any size of print are in brief: First, hang your finished frame by the glass, thus putting the strain where it belongs; second, don't waste large glasses on small prints, because a mat loses half its effect when covered with glass, and has no need of this protection.

When Winter Wind is Piercing Cold.

Margaret L. Bodine and Nina F. Lewis.

THE IMPORTANCE OF THE STUDY OF ART PRINCIPLES BY PHOTOGRAPHERS.

By W. I. LINCOLN ADAMS.

I RECENTLY noticed an illustrated article, on so-called "Art Photography," in a new magazine handed to me by the newsboy on a railroad train, which seemed to me, unfortunately, to be typical of much that is written and exhibited on this subject. I do not know the author of the article, and most of the photographers represented by the illustrations are also unknown to me, so what I have to say on this subject is entirely impersonal.

The first illustration which happened to meet my eyes was the portrait of a young boy. It was from an undertimed, and underdeveloped negative, and the subject had apparently been lighted without any knowledge whatever of the laws governing artistic illumination. The face of the subject, which is usually the part of a portrait of greatest interest, and therefore is almost invariably made the place of greatest light by the master portrait painters, of all schools, was in this case almost entirely obscured by shadow. The background and foreground was also in shadow, which was proper enough in itself, but which in this case made no contrast with the face, so that there was nothing to throw it into relief. The rest of the figure was also in shadow, *with the exception of a small patch of extreme high light thrown on to the middle of his body*, evidently by reflection, and possibly through an oversight. This small patch of greatest illumination, over the center part of the boy's figure, threw the face, of course, and the rest of the figure into still greater obscurity by contrast, and gave a most peculiar and unpleasant effect to the portrait as a whole.

I called the attention of a well-known figure painter who happened to be sitting by my side at the time, to this illustration and asked him what he thought of it. His laughing reply

Keepers of the Flock

Mrs. J. E. Bennett.

Fleur-de-Lis. Dr. W. F. Zierath.

was that it was "an example of the violation of every known rule of art!" He then good naturedly went on to comment on the other illustrations in this article, and in most cases it apeared that they were distinguished for *violations* of fundamental art canons. And yet they had been selected by the author as examples of art photography.

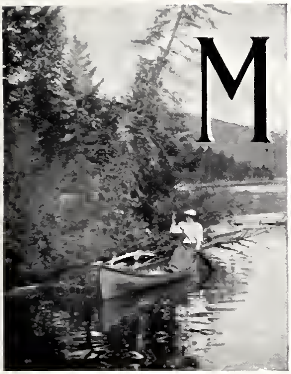
We have all seen exceedingly good pictures made by the new school of photographers, and we are familiar with the capacity of the camera to make really artistic pictures. The trouble with many of the attempts to make pictorial photographs is that the photographers are not familiar with the laws underlying pictorial composition and lighting. They try to make their photographs look "different" from the old style photograph without, apparently, any intelligent plan as to what they wish them to look like. Thus, they occasionally stumble upon a result which is artistic and pleasing, but they are quite as likely to, and perhaps more often do, produce a result like the portrait of the boy which I have commented upon above. Originality, in itself, is not necessarily artistic, any more than is imitation, which is another serious failing of this school of photographers. Many of their failures from the artistic standpoint are made in the effort to produce photographs which look like some paintings they may have seen.

It has seemed to me that the importance of art instruction and art study has been overlooked by practically all photographers. In order to produce works of art, either in painting or sculpture, the successful artist undergoes a long course of study and practice in his chosen profession. But only too many photographers seem to think that anyone can produce an artistic photograph by simply making it look different from other photographs, or possibly by imitating the effects of some painting. Why they should believe that artistic results can be produced in photography without the study of art principles, and a long practice of them, seems quite unreasonable to me, and it is hoped that in the future more serious thought and study will be given to the fundamental laws of art, before an attempt is made to put them into practice.

PORTRAIT. Helen Plummer Gatch.

APERTURES.

By J. A. ANDERSON.



MANY amateurs who know that the light which makes the picture gets into the camera through a "hole," are entirely ignorant of the relation of this circular opening to the result, and of its effect upon exposure, definition, "depth," and "atmosphere."

This opening may be of any size, from a "pin-hole" to the largest the lens is capable of using, but we should be quite at sea if left to decide on the size to be used, by mere inspection.

So the lens makers give us a series of definite sizes, bearing certain relations to each other and to the focal distance of the lens, and controlling, in a definite way, the relative times of exposure and the quality of the definition.

The sizes of these apertures are such that each is half the area of the one that precedes it, thus admitting half the amount of light and, in consequence, requiring twice the time of exposure. This is a point which is to be fixed firmly in the mind. The only exception to this rule, as to the relative areas, is when the construction of the lens is such that the largest aperture does not bear the same relation to the next smaller, as that which exists between the succeeding numbers of the series. Another equally important principle of that defective definition is improved by reducing the size of the aperture.

The sizes of the apertures are indicated by figures engraved on the lens or shutter, or on movable "stops." There are two plans for this in use. One is known as the "f" system, because it shows, in fractional form, the relation of the diameter of each aperture to the focal distance of the lens. Thus f/8 means an aperture having a diameter equal to one-eighth of the focus. The figures placed on the lens or shutter are usually without the numerator "f," and any decimals in the denominator are usually omitted.

The other plan, derived from the former, is termed the "uniform system," or "U. S.," and shows the numerical relation of the areas of the apertures, in inverse ratio, and the consequent relative exposures. Thus, No. 32 is one-eighth the area of No. 4 and requires eight times the exposure.

The corresponding sizes of the apertures in the two systems are the same. Any one not familiar with the matter may determine which plan of marking is used on his camera, by comparing the figures on it with the following:

The "f" system....	8,	11,	16,	22,	32,	45,	64.
The "U. S."........	4,	8,	16,	32,	64,	128,	256.

White Leghorns.

Either system may be extended in like ratio and, as before indicated, either may be preceded by figures indicating the largest aperture of the lens, which may bear to the next number a relation different from the regular ratio of the series.

The advantage claimed for the "U. S." is that the figures show the precise relations of the times of exposure. It is understood, however, that its orginators and many other photographers now prefer the "f" system. Some lens makers, however, adhere to the "U. S." in marking their lenses and it does not matter much which is used when one becomes accustomed

STUDY OF A HEAD
R. Dührkoop

to it. In writing on the subject the "f" plan is usually made use of.

It is well to look up the subjects in photographic works, which treat of it more fully than is practicable here. Some back numbers of THE ANNUAL give valuable information respecting it. Here we are chiefly concerned with the practical application.

As there is a limit to the space over which the lens will project the image with the requisite definition, the largest aperture is made of such size as to confine the rays of light within such limit. If they were allowed to extend beyond the definition they would be faulty. But, for reasons for which there is not space here, a smaller aperture will give good definition over a larger space and, if necessary, the lens may thus be used for a plate larger than that for which it is listed. The smaller aperture is also to be used to obtain desired definition in parts of an object which are not in the same vertical plane, as is always the case excepting in photographing flat surfaces.

FARM PRODUCT.

In focussing upon one part of a view, for instance, the nearer or more distant parts will more or less lack definition, and, if better definition is desired and cannot be gotten with the swing back, it is necessary to "stop down," that is use a smaller aperture, bearing in mind, however, that this will require an increase in the time of exposure.

Cases may occur in which speed is all important and definition must be subordinate. A recent case of this kind, with the writer, will illustrate this. In photographing a flock of several hundred fowls, in constant and rapid motion, only the fastest speed of the shutter would serve, and, in focussing on the immediate foreground, and taking the risk of aperture f/11, the distant parts of the view were still not in satisfactory focus, but must be left so. This, in 1/150 of a second, with bright sun at 3 o'clock, and a rapid plate, gave fairly good results for the fowls but not very good for the distance. If it had been thought safe to use a smaller aperture, the distance would have been better.

A Maine Meadow. (Pin-hole).

It will be noticed that in many interesting pictures of birds and animals, which are published, the background is much out of focus, which is doubtless owing to the necessity of sacrificing it for speed.

After photographing the fowls, the baskets, containing the eggs collected in three or four days, were undertaken. These were in a small place, with but one available spot, quite near them, for the camera, with scant light. Here was so great "depth" in the object that the requisite definition made aperture f/45 necessary, and this was allowable, as the subject was quiet. The exposure, as determined by actinometer, was three minutes, being 27,000 times the exposure for the fowls, assuming that the shutter was correctly timed. If it had been practicable to use f/8, the time, with the existing light, and the rapid plate used, would have been reduced to less than six seconds.

Such cases show the need of "stopping down" for definition, when the object has "depth." This is especially important when the object is very near. With a good modern lens and aperture f/64, one may photograph at full size an object having a "depth" of 2½ inches, and get good definition in the different parts, while with f/16 the limit is about 2-3 of an inch. For half size and with f/64, the limit is extended to about eight inches. Formulae might be given here for ascertaining the available "depth" under any given circumstances, but the editor would hold that he had not room for this and that his readers do not care for mathematics, both of which points would be well taken.

CHIPMUNK.

It sometimes happens that a landscape includes water, with desirable ripples, which require quick exposure, while suitable definition in the distance may require some "stopping down," if the swing back does not serve. The judgment must then determine how far to go with this, without losing too much in speed and destroying the water effect. In the example given, with a rapid plate and aperture f/8 in strong light, the exposure was 1/40 of a second. Greater speed would have perhaps given a degree of definition which would have shown the ripples as if frozen, and without the softness which indicates motion. As to the aperture in landscape, it is to be remembered that care is necessary to avoid making it so small as to give too great distinctness and thus destroy the natural indefiniteness or haziness in the distance, which is one of the chief charms.

A little flock of sheep was caught, in motion, in bright sun, at 11 o'clock, on a fairly rapid plate, with f/8, in 1/50 of a second. A smaller aperture or quicker exposure would probably have served.

A Chipmunk, on the jump, was fixed, at one quarter natural size, at the instant of a halt, with f/8 and 1/25 of a second.

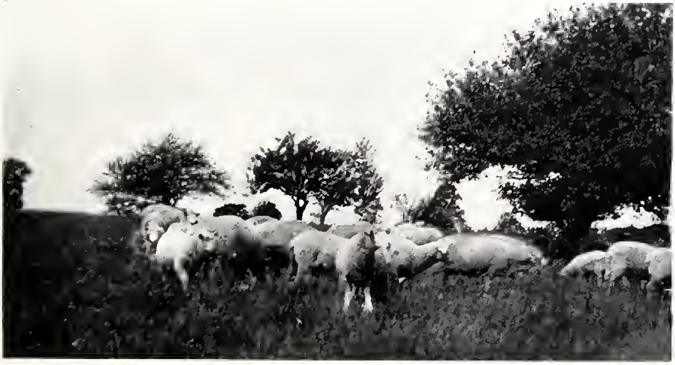
The speeds here given were estimated from the character of the light and the exigencies of the cases, and are as marked on the shutters, of the accuracy of which there is always room for doubt.

It must not be supposed that these examples of apertures and speeds are the best that the circumstances would have admitted of. Others might have given as good or better results. There can be no exact formula for this and expert judgment on these points is only acquired by practice and careful study. Work is done at speeds much more rapid than any herein mentioned, which must be taken simply as illustrations and not as guides to be closely followed. Variations of light and the exigencies of each case are always to be taken into account.

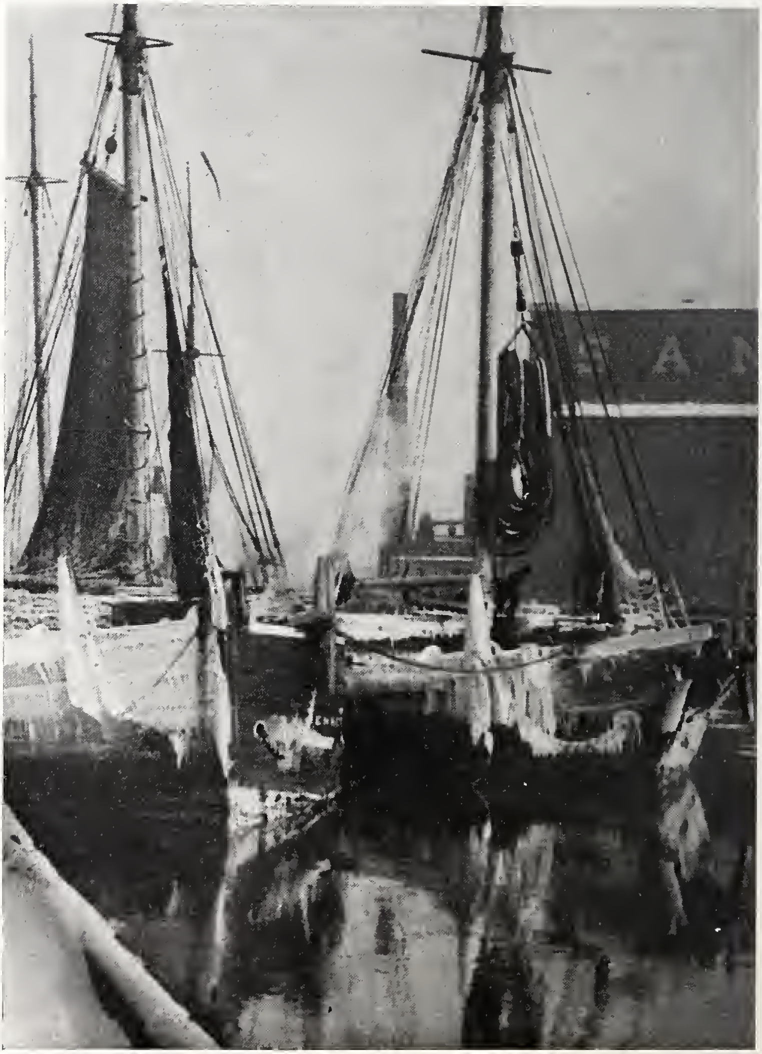
No special reference is necessary regarding the operation of those "fixed focus" cameras, which have but one aperture and require no exercise of judgment with respect to the subject under discussion.

The "pin-hole" is a small aperture, without the aid of a lens to concentrate the rays of light. The result is a certain amount of diffusion, which increases with the size of the "pin-hole," and produces a pleasing softness. Special rules have been devised for this class of work, which are outside the purpose of this article. A single illustration is given, which had one minute exposure, in bright sunlight, with a very rapid plate, and a No. 12 needle hole, distant seven inches from the plate.

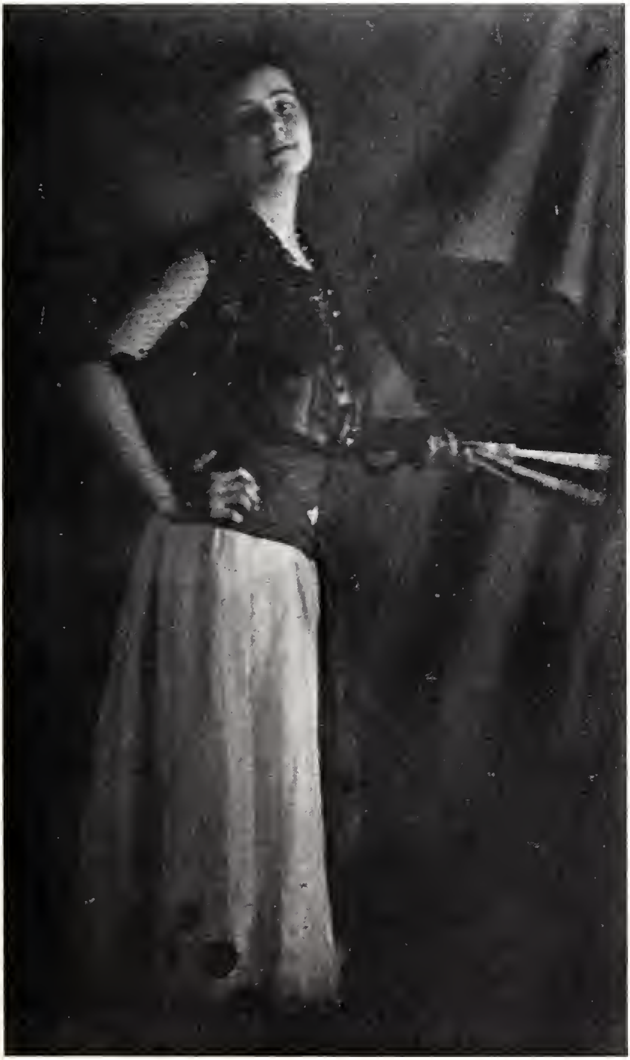
Much regarding our subject must be left unsaid, but what has been presented will serve to empasize the importance of it to those who wish to do good work and may stimulate some reader to study his "stops" and learn how to use them to the best advantage.



SHEEP.



AFTER A STORMY VOYAGE. R. E. Weeks.



Girl with Fan. Charles O. Axell.

A RAMBLE IN SUBURBIA.

By HUGO ERICHSEN.

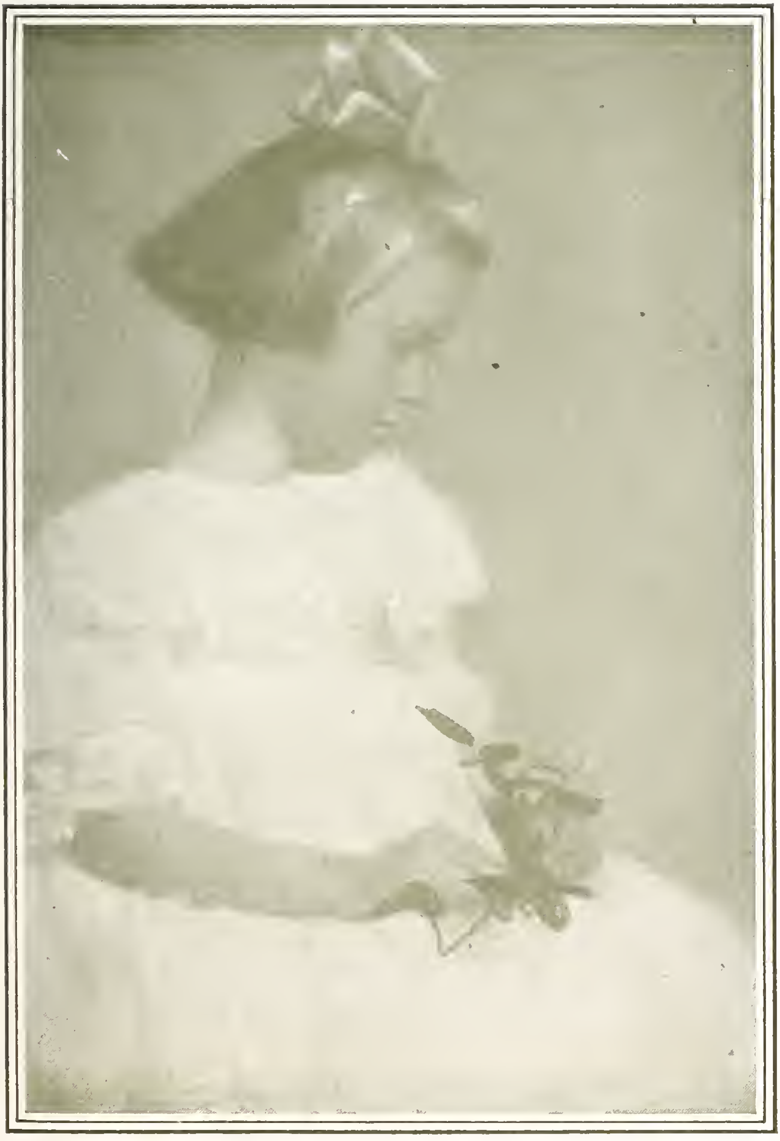
With photographs by the author.

WHEN Detroiters go abroad, they do not have to save for a term of years, go through the agonies of packing a large wardrobe into a small trunk and take a tearful farewell from their families. All they have to do to reach foreign soil is to secrete a dime in their jeans, which is the price of a round-trip fare on the Detroit Windsor and Walkerville ferries. A 15 minute trip across the Detroit river takes one to the dominion of his majesty, King Edward VII and introduces one to a life that is essentially British.

Canadians expect to be judged from the national point of view, but, as a matter of fact, are ultra English and loyal to the core.

One day last summer I experienced a desire for foreign travel and betook myself to Walkerville. On coming ashore, I was eagerly welcomed by a government official, who turned out to be a customs' inspector. "Please to step in here, sir!" he said politely, indicating his office. I stepped. I noticed that in our manoeuvers he never took the precedence but allowed me to go ahead; possibly he was afraid I would run back to the boat again and deprive him of his chance to inspect something. These custom officials in the Canadian frontier towns are lonely men and much to be pitied. I would much rather be connected with the department of customs at Ottawa, preferably in the capacity of boss.

Well, to get back to the inspector, he examined the little cycle-camera I carried with me as though he expected to find diamonds in it and then made me promise solemnly that I would inform the customs authorities at the point of my departure, which was to be Windsor, a port further down the river, that I had entered by way of Walkerville. By this time



THE ROSEBUD
Edith H. Tracy

I was ready to promise anything, and it is really not my fault that I forgot to inform the Windsor officials that a man was leaving their country who might have been a nihilist if Russia had happened to be the land of his birth. My name and address and signalement had been taken down and the whole matter, I presume, was made the subject of an official report, which must have given my friend, the inspector, no end of enjoyment and did not do anybody any harm.

IVY LODGE.

IVY LODGE.

The moment I was released I started up Devonshire Road, past the Crown Inn and the Victoria fountain to inspect the distilleries for which this Ontario town is famous or, as some people might say, infamous. About all they allow you to see of the distilleries is the office and warehouse. At the rear of the office building, there is a beautiful fountain, of which an illustration is given herewith. This alone is well worth a visit to this suburb of Detroit and is superior in every respect to the fountain that is dedicated to the Queen in the public square

The sight of the thousands of barrels of "booze" stacked up in the warehouse is appalling. One cannot help thinking of the misery they are capable of causing, even though they may brighten social occasions and add to the enjoyment of existence. Whiskey, like all the good things of life, must be used with moderation in order to be of benefit. Rightly used it is a blessing, wrongly a curse.

Gateway at St. Mary's.

Strolling slowly along the road named after the duke of Argyle, they have a great penchant for commemorating the gentlemen of the strawberry leaves in Walkerville. I could not help noticing the quaint character of some of the houses so unlike our own. Even the chimney-pots looked as though they might have been imported from "deah old Lunnon," and, behold, in one of the spacious, well-kept gardens, a typical English old gentleman, with a velvet coat and waistcoat and checkered trousers was taking his constitutional, with his hands behind his back, up and down, up and down, like a soldier on guard.

Walking to the end of Devonshire Road, I came upon St. Mary's Gate, a queer name for a thoroughfare, on which the Gothic Church and local burial-place are located. For, in accordance with the tradition of Merry old England, it would have never done to plant the Walkerville dead elsewhere. An illustration of one of the gates of St. Mary's church is presented herewith. As will be seen, the gate is quite ornamental, despite or perhaps because of its simple lines.

But the crowning feature of the Walkerville trip was a visit to "Ivy Lodge," which is located just beyond St. Mary's, and is one of the most picturesque country houses it was ever my good fortune to inspect. It is a monument to the genius of Albert Kahn, one of Detroit's foremost architects, to whom the City of the Straits owes its beautiful "Beth-El" temple, on Woodward Avenue, and other notable buildings. As photographs of the front and rear views are given, a description is unnecessary.

Fountain Stairway.

In twenty minutes the trolley line transported me from Walkerville to Windsor, a city of ten thousand inhabitants, where I had a good glass of " 'alf and 'alf," roamed the streets and peered into the shop-windows, took another look at the old cannon that was captured at Sebastapol, and finally wound up at post office, where I lounged about for some time and watched the stone masons at work on the memorial fountain that is to commemorate the Windsor boys who fell in the Boer war.

As dusk was falling I entered one of the hotels on Sandwich Street, a much frequented thoroughfare that runs parallel with the river, took a seat fronting the street, and watched the crowd stream by homeward bent.. I had no difficulty at all in imagining myself in a foreign city, what with an occasional tam o'shanter and the unmistakably English type of many of the countenances, an illusion that was only dispelled when I reached the ferry landing and was met by an American newsboy, yelling at the top of his voice: "Evening News! All about the triple murder!"

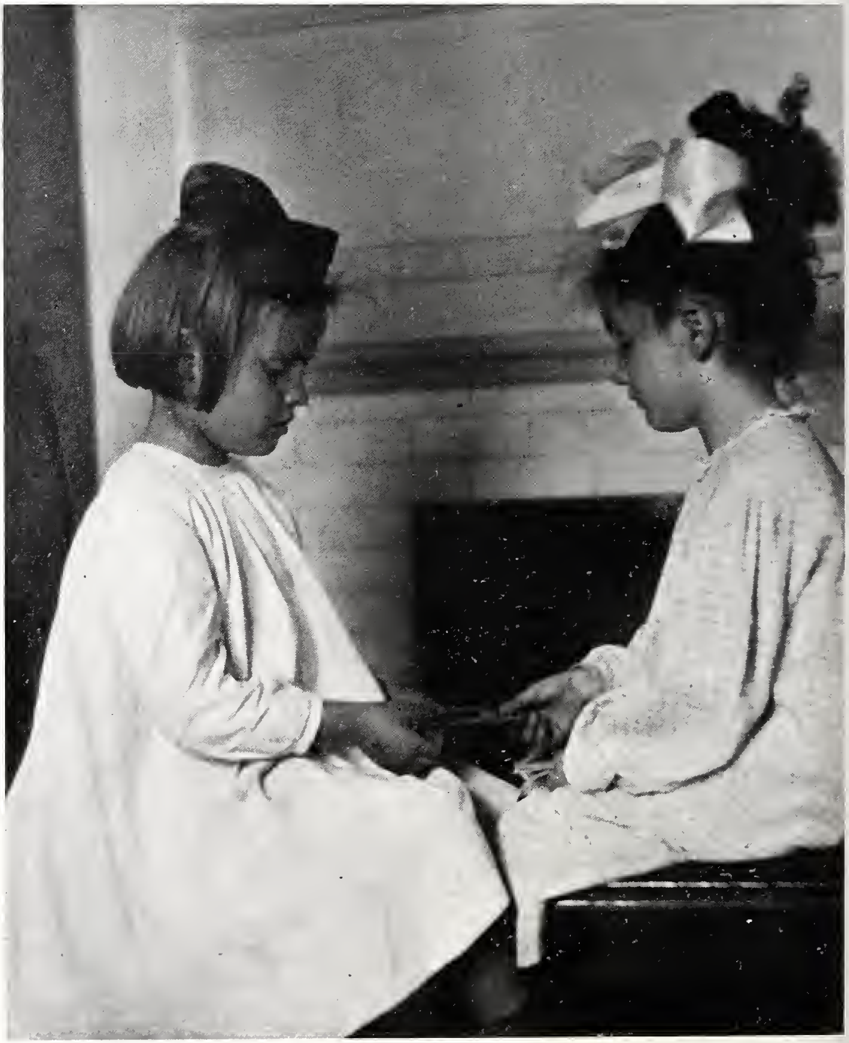
THE BEND OF THE RIVER. Rev. E. G. Watts

WINTER. A. B. Hargett.

An Oregon Landscape. George F. Holman.

SUMMER. Walter C. Scott.

PREPARING THE NETS. A. Gomez Gimeno.



Occupation Serious. Mrs. J. E. Bennett.

BY THE CANAL.

BY H. COOPER.

VISITORS to England, are not likely to purposely seek the picturesque scenery to be found here and there by the banks of our canals.

It is true that much of our canal scenery is tame and uninteresting. But the decay of our canal traffic, incident on the introduction of railway sixty years ago, has led to the partial neglect of our waterway. Nature has reasserted itself and the trim, clean cut bareness of the canal has been obliterated and the canal scenery of England, in the midland countries especially, amply repays a ramble to the photographic enthusiast.

In Northamptonshire this is especially true. About fourteen miles from Northampton, on the banks of the "Great Junction" canal the waterway is through a cleft of small hills, the banks are thickly wooded and except for the "towing" path, it is difficult to realize that these streams are man made.

Spending my early days here the memory of them often returns to me in the midst of a busy town life. Here I received my first lessons in the "gentle art," and to this spot I have often wandered in later years with my camera. But these scenes can seldom be adequately reproduced except by the aid of the stereoscope.

Years ago we allowed the stereo slide to fall into disuse. But I am pleased to know that in America it retains its popularity. Certainly here by our canals stereoscopic photography may be indulged in with abundant prospect of success.

By the Canal I love to go,
Where the willows and sedges grow
Where in the glassy stream the sky
As in a mirror seems to lie
Storm or sunshine or rainbow bright,

Amber evening or moonshine white.
Heaven above and Heaven below
By the canal I love to go.

By the Canal.

An American Patriot.

Randolph.

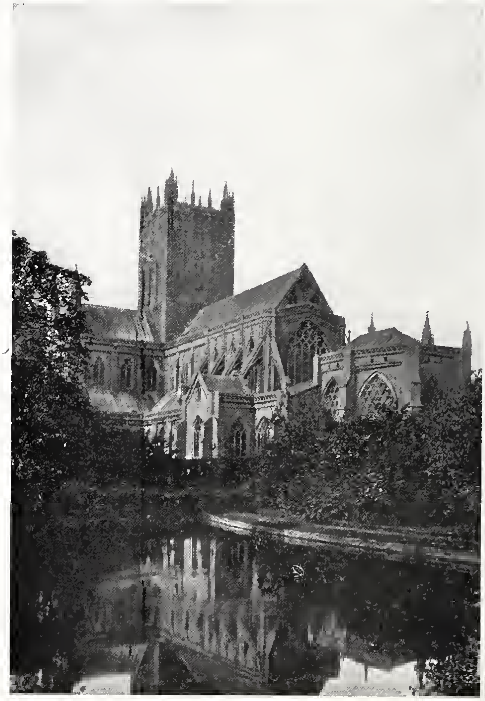
The Woods. Theodore Eitel.

THE CATHEDRAL CHURCH AT WELLS.

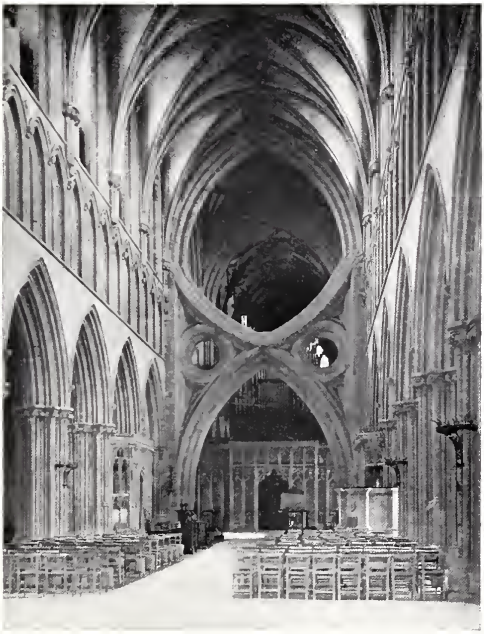
SOMERSET, ENGLAND.

By T. PERKINS.

THE little Somerset City of Wells, a small market town only as far as size is concerned, for its population is under 5,000 to be reached only by branch lines, though it has played no part in the history of the country, still has one claim to distinction such as no other city in England or perhaps in the world can boast of; for at Wells, as Professor Freeman pointed out, may be found the best example of a secular Cathedral Church with its subordinate buildings; no where else can be seen so many of the ancient buildings still standing and still put to their original use. Moreover, the site is delightful, the city is set under the Menclip hills within easy reach of places famed in legend and history, associated with the Keltic Arthur and the West Saxon Alfred, Avalon and Camelot, Athelney and Wedmore. True it is that no part of the church we see to-day existed in the time of King Alfred, that nothing in it dates back further than the Episcopate of Bishop Reginald (1174-1191), that the church itself is one of the smallest of the old Cathedral churches of England, if we put on one side those that are only fragments of their original selves, such as Carlisle and Oxford, but yet for beauty of detail, completeness of plan, and symmetry of design it can hold its own against all rivals. As we approach it from the railway station and cross the ample market square, we see two of the old gateways of the precincts, the "Bishop Eye" to the south leading to the moated palace of the Bishop and the "Pennylers Porch" through which we gain access to the old cemetery now a spacious stretch of level turf, lying before the unique West Front from richly painted niches in which in olden days, before many of them perished at the hands of bigotted iconoclasts or were weathered by sun and rain, tier above tier statues of Bishops and Kings of the Rising Dead, of Angels and Apostles looked down upon the mourners who stood round the open grave silently speaking to them of victory and hope. Attempts have been made to identify the many figures that still remain, but no absolute certainty can be arrived at; more success has attended the interpretation of scenes from Old and New Testament history contained in a series of quarter foils running along the western walls and round the buttresses about thirty feet from the ground. Objection has often been made to the West Front, on the ground that it is not a true termination of the building; it was never intended to be so, but only a vast screen for the display of the beautiful 13th century statuary which it carries. It will be noticed that the doorways and windows are inconspicuous, the former compared with the vast contemporary building in France seem poor and mean, but we must remem-



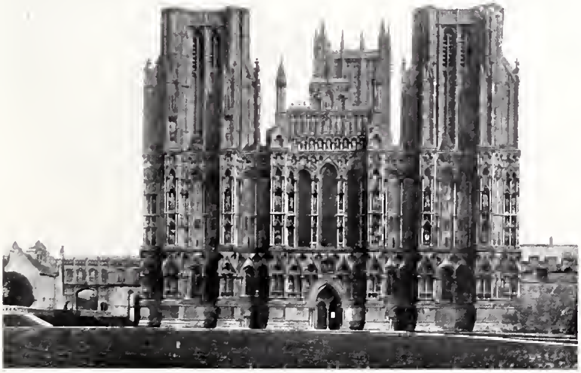
ber that whereas at Amiens and Rouen and other fine French churches the western doorways were intended as the regular entrances for lay worshippers, at Wells and most other English churches the general entrance into the building was through porches on the North or South sides of the nave. At Wells there is a very fine N Porch, the archways within which has so far escaped the decorating touch of the restorer. The upper parts of the Western towers were a later addition to the building, they are indeed of later date than the 14th century Central Tower, the building of which caused a settlement of the foundation, necessitating the introduction of massive and curiously constructed arches under three faces of this tower, as we see when we enter the nave. On the North side of the church rise the octagonal chapter house upon its "Undercroft" or "Crypt" as it is often called; from the side of this runs a bridge known as the chain gate crossing the road and leading to the "Vicars' Close," a series of small houses built in two



rows facing each other intended as residences for the Priest Vicars who took the place in the services of the Canons, many of whom, in course of time became non-resident. The "Vicars' Close" built during the 14th and 15 centuries, is now occupied by students of the Wells Theological College. One of the most beautiful views of the church is to be obtained from the Bishop's garden looking across the lake supplied from the springs or wells from which the city derives its name; from this point we may see the reticulated windows of 14th century date of the Lady Chapel, and the fine proportions of the central tower. Though the interior is not so striking as that of many other Cathedral Churches, yet there is no lack of interest about it. The somewhat massive pillars of the main arcading have beautifully carved capitals especially those in the transept, here we see many of those humourous subjects in which mediæval carvers so much delighted—men robbing an orchard followed by the farmer's vengeance—a fox stealing a goose, a woman extracting a thorn from her bare foot, a cobbler at work, and so on.

The stairs leading to the Chapter House, and also to the "Chain Bridge" are most interesting and the interior of the Chapter House is very beautiful. Nor should the undercroft be missed, within it are preserved many fragments of stone carving, a cope chest an iron door and a large oaken chest covered with iron bands, as well as other antiquities.

It is impossible in the space at our disposal to sketch the history of the building or to touch upon many of the interesting features of the building. The accompanying illustrations, however, will give some idea of the beauties of the Cathedral Church of St. Andrews at Wells.



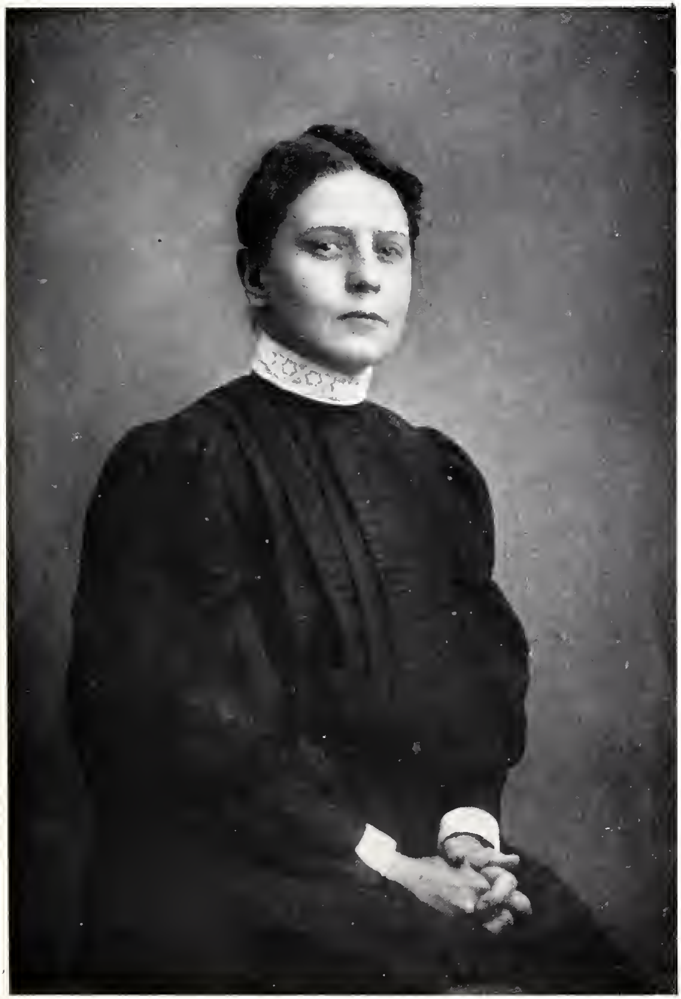
A MISTY MORNING Dr. W. F. Zierath.

VINA. M. A. Mullen.

A FEW HINTS ON FLASHLIGHT PORTRAITURE.

By RUSSELL W. TAFT.

A BRANCH of photography that is commonly little practised, but which is extremely fascinating and absurdly simple, is flash light portraiture. A few hints, therefore, on the *modus operandi* may not be amiss, and may serve to introduce others to a charming photographic diversion. To begin with the background, almost "any old thing" with a plain surface will do, but an ordinary dark green window shade leaves little to be desired. Disengage it from its brackets and if there is a doorway with a portiere in near at hand the pole of the shade may be thrust between the portiere pole and the top of the casing, or indeed it may be unnecessary to remove the shade from the window at all. At one end of the upper corners of the background pin or tack one corner of a large sheet and draw it into the room at right angles, attaching the other corner to a friendly chandelier. If no chandelier be present a piece of stout cord and a tack will serve the same purpose. The sheet should be drawn sufficiently taut to get rid of wrinkles, its purpose being to soften the light. About three feet in front of the background place the subject on a piano stool, preferably, since, the exposure being practically instantaneous, the ease with which the piano stool may be whirled about obviates much "fussing." On a line about three feet in front of the subject, and on the other side of the sheet, place a stepladder, and on this, at a height of about six feet from the floor and three or four feet distant from the face of the subject, the flash apparatus may be set. Either Eastman's flash cartridges or Eastman's flash sheets may be used, the preference being



NONCHALANCE.

in favor of the latter since they give a softer light and less smoke. One number three cartridge or one and one-half number one sheets will be ample. Isochromatic plates should be used.

Sa Rieuse.

Focus the camera by the aid of a burning taper or a match held on a plane with the subject's eyes, draw the slide, placing it to shade the lens from the light, and open the lens, using the full aperture. It is unnecessary to put out the light in this room. The subject is then posed, and at the right moment the cartridge fuse, or one corner of the flash sheet, as the case may be, is ignited. An empty shoe box will be found an excellent medium to which to pin the flash sheets.

The accompanying portraits were made in accordance with the suggestions herein outlined. Flash sheets were used and the plates developed in metol-hydro.

EARLY AUTUMN. J. L. Rosenberger.

THROUGH A COURTWAY. Arthur W. Walburn.

In the Good Old Summer Time. Denis H. Brookins.

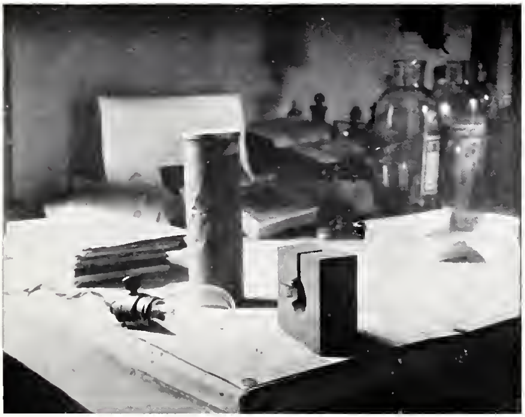
A SIMPLE DARK ROOM LIGHT.

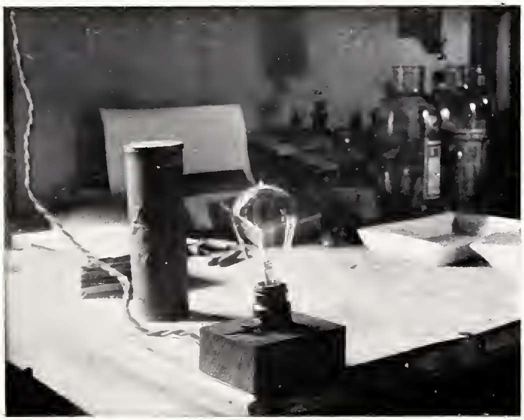
By RICHARD HINES, Jr.

IT is so easy to promise; it is so hard to redeem the promise. When the editor courteously requested me several months ago to "write something" for the American Annual of Photography, I readily promised, and not to be outdone in courtesy sent my reply by return mail. The date fixed by the editor for the fulfillment of that promise seemed sufficiently remote for the preparation of half a dozen articles on most any subject; but being an editor myself, and with the office devil yelling "copy" into my ears day and night, it has seemed that there has been very few spare moments in all those days that intervened since I gave that promise, for the fulfillment of it. Last year I failed to keep my promise through stress of work; but this year I shall keep it.

I propose to describe a very simple dark-room light which I have contrived, and for which I have cast aside all the other lamps I have, including a fine Carbutt lamp. The Carbutt lamp is all right, but in my work I have found it unwieldy—too much trouble to heft it up and give it the half turn necessary to get at the white light side; too much trouble to shift the large 8x10 glasses when one wishes after developing a plate to make a few developing paper prints. Perhaps it is laziness that has caused me to evolve this simple arrangement; perhaps it is the aversion that one of aldermanic proportions has to stooping down and hefting things when there is no necessity for it. Then the change from one kind of light to another can be made in an instant, "in the twinkling of an eye, at the last trump," so to speak, and that is why I think this simple affair will appeal to my fellow amateurs.

The arrangement consists of a sixteen candle power incandescent electric lamp, a pasteboard tube and a square block of wood about four by four inches and one and three-quarters inches thick. These component parts are shown in the first illustration. In this illustration the block of wood has been so placed that the reader may see the inch and a half boring in the centre for the collar of the electric lamp to fit into, with the cut on the top side, for the accommodation of the cord, and a small place chiselled out on the left side for the lamp, switch or key. Any pasteboard tube can be used that is large enough in diameter to fit over the lamp snugly. From the centre of this tube a space is cut, and this space is covered with several thicknesses of orange or post office paper for use with developing papers, and another similar tube is covered with several thicknesses of red paper for use in developing plates. The



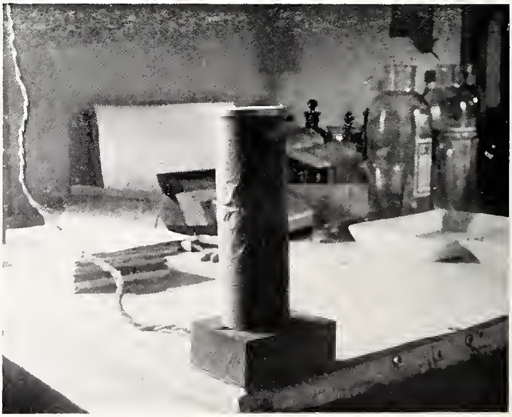


particular tubes which I use were obtained from my friend, the weather man, and originally contained the waxed paper used in making stylographic copies of weather maps. One of my tubes is open at both ends, and I cover the upper end of that one with the top of a tin box.

So much for a description of the component parts of this apparatus. The second illustration will show the electric lamp placed in its base, and the base set square with the corner of the table and along side is the tube ready to be placed over the lamp when needed. On the right side of the print can be seen the printing lines, which are measured from the centre of the lamp, lines being marked at 6, 8, 10, 12, 14, 16 and 18 inches from the centre of the lamp.

The third illustration shows the tube placed over the lamp and ready for developing prints. When ready to print another print the tube is lifted and the white light is instantly ready for printing; the simple replacing of the tube makes the light instantly ready for the development of the print.

The same method is used in developing plates, with the exception that the tube fitted with red paper is used. I do all my dark-room work with this lighting arrangement—bromide printing and enlarging, lantern slide printing by contact and development, and developing of plates. The longer I use it the more pleased I am with its convenience and its simplicity. I can recommend it to all those who are looking for something simple and handy.



Barefoot Days.

William H. Zerbe.

QUEEN ANN'S LACE. Margaret L. Bodine and Nina F. Lewis

A FEW KICKS AND A WORD ABOUT THEATRICAL PHOTOGRAPHY.

By CORYDON G. SNYDER.

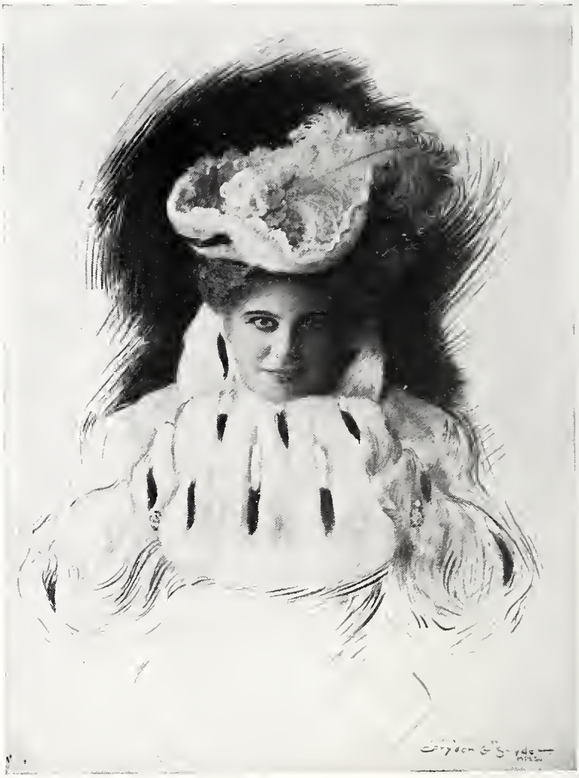
Maker of the Corydon Etchings.

LITTLE use have I for the man who pretends to be an artist and swearing by straight photography, says he never resorts to manipulation. He is usually a crank or a liar.

Straight photography is all right for the man who is doing a cheap portrait business and to whom it would mean too much extra expense to add manipulation. He must of necessity get a negative that will not take any more work than necessary in the printing.

According to the straight-photography crank, if a portrait is taken with a vignette in front of the lense it is a straight photograph; but if it is vignetted in the printing it is faked. The crank has a series of inconsistencies like this, just as if it made any difference how the picture is obtained as long as its artistic value is there. The only thing that makes a difference is the quality (of course we paper men like to see quantity, too).

Certainly there are extremes. My own work, the Corydon Etchings, done by the Sketch or Etching methods, are photographs and at the same time partly etchings or drawings; still, they are first taken with a camera and lastly printed on photographic paper, and I can claim there is as much straight photography in them as there is in lots of prints that don't show the hand work. When we have a Salon, the committee that passes on the pictures either takes it upon themselves or are instructed not to pass upon any prints that show manipulation. This means, of course, any thing that has been done so crudely that it shows how it has been altered. Any thing they are not sure about is all right, artistic qualities provided. When anyone



Finished Print.

sends in a sketch or etching effect they say "it is not straight photography," and therefore should be thrown out. On the other hand, in comes a picture that has, maybe, more hand work in it only that it is disguised, so it's all right to be passed on.

The sketches and etching work depend upon the hand work for part of their beauty; but so do the other "faked up" prints. Personally, I don't care how many "faked up" photos get into the Salon if they deserve it from an artistic standpoint. But, as long as we all know that most of the prints are more or less "faked," there should be no line drawn as to the character of the faking as long as the picture is artistic in the true sense Put the prints that show hand work off in a group by themselves if you will, but give all of us "fakers" a chance.

A great many accuse me of not giving any care to the original negative but depending entirely upon working the plates up by hand work; however, I always try to get the best negative I can, and as near what my idea of the finished print is to be as possible. The theatrical photographer encounters many difficulties that the average portrait photographers know nothing about. As most of my work is theatrical, I have excuses, both for making the style of work I do and for some of the poor negatives I have had sometimes to start with. I will give my method of photographing players in hope that some parts may be new to those who aspire to theatrical photography.

Theatrical photography must have, aside from the likeness and characteristics of the player, an advertising value. It must be sufficiently striking to catch the attention and beautiful enough to hold it. I don't mean to say that every subject must appear beautiful; but, that the picture must have beauty of line and composition, no matter what the subject may be.

Before I took up photography I made a practice of carrying a small sketch book in my pocket, and when I went to the theatre I would draw quick sketches of the poses and costumes of the players, often making finished drawings from the sketches. My method is partly the outcome of this practice and, although it differs in execution from most others, the aim is the same. We wish to get a picture of the player that will have all the characteristics of pose and expression, if in cos-

The Original.

tume, so much the better; for the actress on the stage is the actress that the public know.

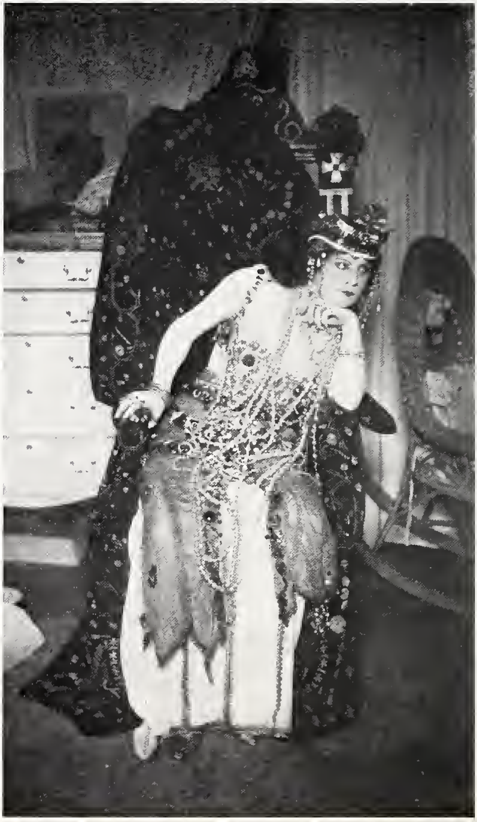
I never take a portrait of an actor or actress without first seeing him or her from "the front" first, if it is possible to do so. There I make quick sketches of the poses. From these I get my idea for the finished picture, and sometimes even make a drawing from my sketches and then try to get a photo with a similar effect. Of course, at the sitting, ideas will present themselves for new poses, but I find that the poses I had in mind nearly always make the best pictures.

It is not necessary that one must draw to be able to apply this method to this work; a good memory, or notes will do, with the ability to tell a picture when one sees it in the real. After training oneself to see pictures, the players form themselves into a succession of pictures. Pick out the best ones. Of course you get lots of ideas for fine pictures that you will never be able to take, even if you have an order. And then again I have had ideas formed of just what I would make of certain players long before I ever thought of having the chance to put them into execution. When the opportunity came, in the shape of an order, I knew just what to try for.

While the idea is the most important part and the photographic work is only a means to an end, a great many difficulties confront one in taking the negative that never occur in ordinary studio work. There is no doubt that the studio is the proper place to take the sitting if possible. Most of my work, however, has been taken outside of the studio and the style of my work is almost as much of an outcome from this necessity as from the ability to do it.

When I have formed my idea for the finished picture the next thing to figure on is how to get the negative. Often the actress hasn't the time to come to the studio with costumes, or the accessories are not obtainable. If you can't get them to come to you, you must go to them. I have taken pictures by spot light on the stage after the show; sometimes in the dressing room between the acts while the stage hands brought in the accessories and took them out again in time for the next act.

The print from a negative before altering of a Cleopatra picture will give some idea of the difficulties. This negative was taken by the incandescent lights of the dressing room. The muff picture, of Miss Florence Stone, will show by comparison how much of the original was taken out. There are lots of ways of treating the original negatives of prints for getting rid of the background, other than the style I use, or, it is so often possible to arrange the background so as not to be objectionable; also a portable background can be used. Personally, I don't pay much attention to the background, except where the picture needs accessories; but prefer to solve the problem by substituting hard work.



A Hazy Morning in the City. Arthur W. Walburn.

"PEACH BLOSSOMS." James R. Iglick.

STUDIO ADVERTISING.

By BURTON VAN RENSALAER.

MUCH space has been devoted of late in the photographic journals to the question of advertising for the professional; suggesting and devising methods for securing re-orders or sittings from old customers, and persuading as many new customers to visit their studio as possible.

In advertising any commodity you must appeal to the persons most likely to be interested, to create an active, not a passive interest.

In studio advertising you must appeal to the woman. Why? In the first place, if married she is the heart of the home circle, and from her maternal interest and pride in her family she is most susceptible to the argument of showing her friends and relatives what a fine looking husband and children she posseses, and, incidentally that she, herself possesses a fair amount of pulchritude.

The young unmarried woman does not need any argument other than that of quality.

The average man views a visit to the photographer with about the same calmness of mind that precludes a visit to the dentist, so if you want to gather him in, you must do it through the power behind the throne.

Now comes the question of mediums: Your card in the local daily or weekly paper will afford you a certain amount of general publicity.

In some seasons, like commencement time and the holidays, special and attractively worded advertisements will bring results, but in such seasons you expect more business, and you will obtain a certain percentage even if you do not advertise. What you need most is publicity that will bring business in the more quiet seasons.

FINIS.

George F. Holman

Taking for granted that you are going to make your appeal to the woman, how is the best way to go about it?

As before stated, your card in the local paper will afford you a certain amount of publicity but cannot be depended upon to draw any special business.

When a woman reads the paper, the dry goods and grocery announcements appeal to her most, the balance of the advertising receiving scant notice.

Unless you are catering to the cheapest trade, the printed dodger, promiscuously distributed, will be worse than time and money wasted.

What you must have for results is a direct personal appeal, suitably and tactfully worded, and printed in keeping with the position of the prospective customers, and impressing them with the fact that you are equally endowed with culture and refinement.

You must also take into consideration the fact that a woman has not the business training of a man, and consequently the short, snappy and possibly epigramatic letter or circular that would convince the man would be utterly lost on her. We have seen recommended the use of imitation type written letters with the names filled in from your studio register, city directory or blue book.

The woman from her lack of knowledge of business methods will be more apt to speculate on how you happened to know her name and address or where you secured it, than on the contents of your letter with the result that it goes into the fire without benefit to you.

Every woman possesses a certain amount of refinement, a love for the beautiful and dainty, and the writer is inclined to favor a tastefully gotten up booklet or leaflet, illustrated with one or more half tones from your best negatives and offering some special inducement to visit your studio.

With a well and tastefully arranged booklet you will not find a reduction in price necessary to secure results, rather dwell upon your superior facilities and your ability to secure novel and artistic results.

In preparing this sort of advertising, consider first that you are endeavoring to reach the best people in your vicinity, select your list of names carefully, this will reduce the cost materially, allow you to get up a better booklet, thus increasing the power of your ammunition and assuring you a hearing from just the people you are trying to impress. If you do not feel qualified to prepare a booklet of this sort, or if you do not have confidence in the ability of your local printer to put the same in type effectively, correspond with some of the printing houses in any one of the larger cities, as most of them make a specialty of preparing all sorts of advertising and printed matter. It will be worse than money wasted to send out anything not fully in keeping with the quality of the people you are trying to reach.

Advertising pays, but it must be done in the right way and at the right time, and the right time is all the time.

THE VOICE OF THE SEA. J. Edward Greene.

Foggy Day East River. Dr. Albert R. Benedict.

THE KING ON HIS THRONE. Hana Robison.

THE BIRCHES
R. E. Weeks

...Practical Formulae for Plates, Papers, Etc.

SEED PLATES.

Pyro.

By weight.

A.

Pure water	16 oz.
Pyro	1 oz.
Oxalic acid	10 gr.

B.

Pure water	16 oz.
Seed's C. P. sulphite of soda	2 oz.

C.

Pure water	16 oz.
Seed's C. P. carbonate of soda	2 oz.

Use

A	1 oz.
B	1 oz.
C	1 oz.
Pure water	7 oz.

By Hydrometer Test.

A.

Pure water	16 oz.
Pyro	1 oz.
Oxalic acid	10 gr.

B.

Seed's sulphite soda solution	test	60. dg.
Seed's carbonate soda solution	test	50 dg.

Use

A	1 oz.
B	1 oz.
C	1 oz.
Pure water	7 oz.

FACTOR 12.

In very cold dark rooms use 5 ounces of water. In hot weather use 10 ounces of water. For double-coated plates use 18 ounces of water.

One-half ounce of B will give a warmer tone to the negative. The best printers have a warm, brownish-black color. If negatives are too yellow or the shadows show the slightest stain, not due to discolored fixing bath, use 1½ ounces of B.

Sulphite of soda in solution does not keep well. Solutions over one month old should not be expected to be full strength if not made with pure water and kept in well stoppered bottles.

Hydrometers are seldom uniform. For this reason it is best to ascertain the reading of your instrument by making up solutions by weight, and then noting the reading, make future solutions accordingly. If crystal sodas are used, test with good clear crystals free from powder.

Eikonogen-Hydrochinon.

By weight.

A.

Pure water	48 oz.
Seed's C. P. sulphite of soda	2 oz.
*Eikonogen	240 gr.
Hydrochinon	60 gr.

B.

Pure water	16 oz.
Seed's C. P. carbonate soda	2 oz.

Use

A	3 oz.
B	1 oz.

By Hydrometer Test.

A.

Seed's C. P. sulphite of soda solution test 20	48 oz.
*Eikonogen	240 gr.
Hydrochinon	60 gr.

B.

Seed's carbonate soda solution.........test	50 dg.

Use

A	3 oz.
B	1 oz.

*If more concentrated developer is desired in order to secure more contrasts, the water in solution A may be reduced to 32 ounces. Use boiling water in making up this developer. In cold weather a little glycerine could also be added to prevent precipitation.

(FACTOR 12.)

For double-coated plates add 4 ounces of pure water. Use more water in hot weather.

Metol-Hydrochinon.

By weight.

A.

Pure water	64 oz.
*Metol	120 gr.
Hydrochinon	120 gr.
Seed's C. P. sulphite of soda	2 oz.

B.

Pure water	16 oz.
Seed's C. P. carbonate of soda	2 oz.

Use

A	4 oz.
B	1 oz.
Pure water	4 oz.

By Hydrometer Test.

A.

Pure water	48 oz.
*Metol	120 gr.
Hydrochinon	120 gr.
Seed's sulphite ....test 60,	16 oz.

B.

Seed's carbonate soda solution..........test	50 dg.

Use

A	1 oz.
B	4 oz.
Pure water	4 oz.

*Dissolve in the order given. Metol should always be dissolved in water before the sulphite is added, or before it is mixed with sulphite solution, otherwise it may precipitate. If crystal sodas are used add 15 grains of bromide of potassium to 16 ounces of B solution.

(Factor 15.)

Ortol.

A.

Pure water	24 oz.
Potassium meta-bisulphite	90 gr.
Ortol	180 gr.

B.

Pure water	24 oz.
Seed's C. P. sulphite	1 oz.
Seed's C. P. carbonate	1 oz.

Use equal parts of A and B.

(Factor 11.)

Plain Fixing Bath.

By weight.

Pure water	16 oz.
Hypo	4 oz.

By Hydrometer Test.

Hydrometer	test	70 dg.

Do not use a discolored bath. Plates should be left in fixing bath at least double the time it takes whiteness to disappear. This bath must be made fresh every day.

Acid Fixing Bath.

By weight.

A.

Pure water	96 oz.
Hypo	2 lb.
Seed's C. P. sulphite of soda	2 oz.

B.

Pure water	32 oz.
Chrome Alum	2 oz.
Sulphuric acid C. P.	¼ oz.

By Hydrometer Test.

A.

Hypo	test 80,	100 oz.
Seed's sulphite	test 60,	16 oz.

B.

Chrome alum	test 20,	32 oz.
Sulphuric acid C. P.		2 dr.

See that chemicals are entirely dissolved, then pour B into A slowly while stirring A rapidly. This bath remains clear and fixes clean after long-continued use, but should be replaced as soon as it becomes exhausted. Never attempt to restore a spent bath by adding more hypo. Plates should be left in bath at least double the time it takes whiteness to disappear.

If negatives remain 20 to 30 minutes in this bath, the film will become much hardened. This is a great advantage in summer when washing often softens the film. In hot weather fresh fixing baths should be made up more frequently. By fixing longer, less washing will suffice; 15 minutes in running water is enough if plates have been 30 minutes in a fresh, quick-working fixing bath.

Weights.

The ounce avoirdupois (437½ grains) is the one used .

The quantities given in formulæ are mostly divisible by 4, if smaller quantities of developer are desired. The following approximate metric equivalents may be used.

16 oz. (fluid)	500 cc.
1 oz. (weight)	30 grm.
60 grains	4 grm.

Developers for Black-Tone Transparency and Lantern Plates.

Metol-Hydro Developer.

A.

Pure water	16 oz.
Metol	30 gr.
Hydrochinon	30 gr.
Sulphite soda	130 gr.
Citric acid	10 gr.

B.

Pure water	16 oz.
Potassium bromide	15 gr.
Carbonate soda	130 gr.

Use Seed's or dry sodas. Crystal sodas may be substituted by using twice the weight given above. To develop use equal parts of A and B. Developer should be about 70 degrees F., and can be used repeatedly, but should be discarded as soon as discolored, as it then will stain the film.

Developer for Warmer Toned Blacks.

A.

Pure water	16 oz.
Hydrochinon	50 gr.
Sulphite soda (dry)	20 gr.
Potassium bromide	5 gr.
Citric acid	5 gr.

B.

Pure water	16 oz.
Carbonate soda (dry)	½ oz.
Caustic soda	30 gr.

Use equal parts of A and B.

To make a lantern slide by contact, if a 16 c. p. electric lamp is used, the exposure for a medium dense negative should be about 5 seconds at a distance of 2 feet from the light. With the metol-hydro developer the image will appear in about 10 seconds, and development will be complete in from 30 to 40 seconds, according to density desired.

If the warm tone developer is used, expose somewhat longer than for the metol-hydro. Temperature of developer should be from 70 to 75 degrees F.

Fixing Bath.

A.

Pure water	64 oz.
Hypo	1 lb.
Sulphite of soda	2 oz.

B.

Pure water	16 oz.
Chrome alum	1½ oz.
Sulphuric acid C. P.	1 dr.

While stirring A vigorously, pour in B. This bath keeps well. The chrome alum bath, recommended for our regular plate, can also be used. Leave plate in bath a few minutes after all white has disappeared from back. Wash well, and then wipe gently with a wad of wet absorbent cotton.

STANLEY DRY PLATES.

Formula for Developer.

No. 1.—Alkaline Solution.

Pure Water (fluid)		80 oz.
Sulphite of soda (crystals)	(Troy)	6 oz.
Carbonate of soda (crystals)	(Troy)	6 oz.

No. 2.—Pyro Solution.

Water		80 oz.
Sulphuric acid		½ drm.
Pyro	(Troy)	1 oz.

For use mix the No. 1 and No. 2 in equal parts.

To make the same developer with hydrometer test:

Carbonate of soda (hydrometer test 40°)	40 oz.
Sulphite of soda (hydrometer test 40°)	40 oz.

Mix the two for alkaline solution and use pyro solution as above.

Increasing the pyro gives greater intensity; diminishing it, less. If the developer is used the second time, the negatives become more intense and develop more slowly after the first, so that a longer exposure is required if old developer is used. The temperature of the developer is of great importance. In cold weather it should be from 65 deg. to 75 deg. In hot weather from 60 deg. to 65 deg.

Metol-Hydrochinon Developer.

No. 1.

Water	16 oz.
Metol	30 gr.
Hydrochinon	30 gr.
Sodium sulphite (crystals)	240 gr.

No. 2.

Water	10 oz.
Sodium carbonate (crystals)	120 gr.

Hydrometer Test:

No. 1.

Sodium sulphite solution, to test 15	16 oz.
Metol	30 gr.
Hydrochinon	30 gr.

No. 2.

Sodium carbonate solution to test 15.

For use, take one part No. 1, one part No. 2, and two parts water.

EASTMAN'S DRY PLATES.

Pyro-Developer.

No. 1.

Distilled or good well water	16 oz.
Sulphite soda (crystals)	4 oz.
Pyrogallic acid	1 oz.
Sulphuric acid	10 drops.

No. 2.

Water	16 oz.
Sodium carbonate (crystals)	4 oz.

To develop take

No. 1	1 oz.
No. 2	2 oz.
Water	8 oz.

In warm weather, use more water; in cold, less. For Non-Halation Plates, use 16 ozs. water instead of 8 ozs.

Metol-Hydrochinon Developer.

No. 1.

Water	16 oz.
Metol	30 gr.
Hydrochinon	30 gr.
Sodium sulphite (crystals)	240 gr.

No. 2.

Water	10 oz.
Sodium carbonate (crystals)	120 gr.

To develop take

No. 1	1 oz.
No. 2	1 oz.
Water	2 oz.

Acid Fixing Bath.

A.

Water	96 oz.
Hypo	1 lb.
Sulphite of soda (crystals)	4 oz.

B.

Water	32 oz.
Chrome-alum	2 oz.
Sulphuric acid	¼ oz.

Pour B into A, while stirring A rapidly. As the chrome-alum dissolves slowly a stock solution of B should be kept on hand.

Summer Fixing Bath.

In hot weather the best prevention from softening of the film is to make a fresh Hypo bath each day just before it is needed.

After development, wash negative half a minute and immerse in clear saturated solution of alum five minutes, rinse, and fix in

Hypo	4 oz.
Water	16 oz.

Note Following.—The developer should be kept as close to the temperature of 65 deg. F. as possible. See that your stock solutions are kept in well stoppered bottles.

A smaller quantity of sulphite of soda in developer will produce a warmer tone, a larger quantity, a gray or bluish black tone.

STANDARD DRY PLATES.

To Develop.—Development should not be commenced until the eyes are somewhat accustomed to the light of the dark-room. As you flow the developer over the plate, commence to count seconds 0-1-2-3, etc. Note the time of the appearance of the high lights of the image and multiply this time by the factor of the developer you are using. Different developers have different factors. The factor for the Standard Dry Plate Pyro Developer is 12; the image on a normally exposed plate with the developer at 70 degrees F. generally appears in 20 seconds, 20x12=240. At the end of 240 seconds (4 min.), including the 20 seconds before the image appeared, development will be completed. The high-lights of an over-exposed plate will appear quicker, and those of an under-exposed plate slower, than those of a normally-exposed plate. As soon as development is completed, rinse the plate free from developer and place it in the fixing bath. While any normal developer will work well with this system, we give those which we have used:

Pyro Development Formula.

A.

Water	32 oz.
Oxalic acid	20 gr.
Pyro	1 oz.

B.

Sodium carbonate (crystals)	4 oz.

(If dry carbonate or sulphite is used take only one half-the weight.)

Water	16 oz.

(Hydrometer test 40.)

C.

Sodium sulphite (crystals)	3 oz.
Water	16 oz.

When making solution A, dissolve the acid in the water and then add the pyro.

To develop Standard extra or Imperial portrait, take:

A	2 oz.
B	1 oz.
C	1 oz.
Water	6 oz.

(Development factor is 12.)

To develop Orthonon Plates, take:

A	2 oz.
B	1 oz.
C	1 oz.
Water	12 oz.

(Development factor is 12.)

The development of the Orthonon is the same as with the ordinary plate, except that more water is added, making the process of development much slower. Diluting the developer is necessary so that the action will not be too severe on the upper film before the developer has had time to penetrate through to the under one. It is necessary that both film should develop simultaneously.

To obtain greater or less contrast than the normal factor will give, it has been customary to increase or decrease the factor. A plan which has some advantages over this method is to add to, or deduct from, the time of appearance, as the case may require, and use the same factor. For instance, with our pyro developer, whose factor is 12, if the high-lights appeared in 20 seconds; for more contrast call it, say 22 seconds, and for less contrast take a lower number, say 18 seconds.

If the plates are known to be over-exposed, add to each ounce of the developer *before* development two or more drops of the following bromide solution and develop for a length of time equal to that which it would take to develop it in a normal developer plus the time it takes for the image to appear in the "bromide developer."

For example, if with a normal developer the high-lights appeared in 15 seconds, development would be completed in 15x12=180 seconds; but if on the over-exposed plate in the developer to which the bromide has been added the high-lights did not appear until 60 seconds, development would be completed in 180+60=240 seconds.

This method of developing over-exposures I believe will be found to be an improvement on the orthodox method of adding bromide and developing for the same length of time without bromide. It is to a certain extent self-compensating, especially where considerable more than two drops of bromide solution to the ounce is used; for the more bromide is added the longer will be the image in appearing, and the length of time of development will be increased correspondingly. Where two drops or less of the bromide solution are used to each ounce of developer it is equally good to develop for the same length of time it would take to develop the plate if no bromide had been added.

D.

Potassium bromide	1 oz.
Water	10 oz.

For those who like a Metol Hydro developer we give the following:

Water	16 oz.
Sodium sulphite (crystals)	1 oz.
Metol	30 gr.
Hydrochinon	60 gr.
Potassium bromide	10 gr.
Sodium carbonate (crystals)	1 oz.

If the dry carbonate or sulphite is used, take only one-half the weight.

To develop, take one part to three parts water.

Development factor is 10.

Hydrochinon.—This developer is recommended for over-exposed plates:

A.

Water	16 oz.
Sodium sulphite (crystals)	2 oz.
Hydrochinon	160 gr.

B.

Water	16 oz.
Sodium carbonate (crystals)	4 oz.
Potassium bromide	80 gr.

HAMMER PLATES.

The quantity of sodium sulphite in the developer must be regulated to produce the color desired. It is to the photographer's advantage, when using Pyro developer, to use this formula, as most other formulæ call for more Pyro than is necessary for these plates.

Pyro and Soda. By weight.

No. 1.

English weights and measures.		Metric weights and measures.
30 ounces pure water	or	900 c cm.
5 ounces sodium sulphite (crystals)	or	150 grm.
2½ ounces sodium carbonate (crystals)	or	75 grm.

No. 2.

24 ounces pure water	or	720 c cm.
15 grains oxalic acid (dissolved)	or	1 grm.

And then add

1 ounce pyrogallic acid	or	30 grm.

To develop take

1 ounce of Solution No. 1	or	30 c.cm.
½ ounce of Solution No. 2	or	15 c.cm.
6 to 8 ounces pure water	or	80 to 240 c.cm.

More water may be used in warm weather, and less water in cool weather.

Pyro Developer with Carbonate of Soda.

English weights and measures.		Metric weights and measures.
	No. 1.	
32 ounces pure water	or	960 c.cm.
8 ounces sodium sulphite (crystals)	or	240 grm.
1 ounce carbonate of potash (dry)	or	30 grm.
	No. 2.	
24 ounces pure water	or	720 c.cm.
15 grains oxalic acid (dissolved first)	or	1 grm.
1 ounce pyrogallic acid	or	30 grm.

To develop take

1 ounce of solution No. 1	or	30 c.cm.
½ ounce of Solution No. 2	or	15 c.cm.
6 to 8 ounces of pure water	or	180 to 240 c.cm.

When the plate is fully developed and you find the high lights too thin, use less water in the developer; if too dense, use more water.

Pyro and Soda. Three solutions by weight and by hydrometer.

This formula is better suited to all localities than is a two-solution developer. Each property of the developer being separate, the user can vary the quantity of either to meet local conditions. The water in some places is alkaline; then less of No. 2 carbonate of soda should be used. A few trials will indicate the amount that should be used in order to produce the best results. In cold weather the carbonate of soda can be increased a little. During hot weather it is generally best to use a little less of the No. 2 solution, for if the temperature is very high and too much of this chemical is present, the user will destroy the clearness of his plate. The sulphite being in a separate (No. 1) solution, the user can easily modify results by varying the proportion. The water in some localities does not require as much sulphite as in others. Use just enough of the sulphite solution to give the proper printing color to the negative (just a trace of yellow.)

English weights and measures.		Metric weights and measures.
	No. 1.	
15 ounces of pure water	or	450. c.cm.
5 ounces sulphite of soda (crystals)	or	150 grm.
	Hydrometer test 80°	
	No. 2.	
15 ounces pure water	or	450 c.cm.
2½ ounces of carbonate of soda (crystals)	or	75 grm.
	Hydrometer test 40°	
	No. 3.	
24 ounces pure water	or	720 c.cm.
15 grains oxalic acid	or	1 grm.
1 ounce pyrogallic acid	or	30 grm.

To develop, take

½ ounce of each, No. 1, No. 2, No. 3	or	15 c.cm.
6 to 8 ounces pure water	or	180 to 240 c.cm.

If the subject has strong contrasts of light and shadow, use a little less of No. 3 and a little more water than usual.

If the subject is flat and lacking in contrast, increase the amount of No. 3 and use a little of No. 2; a few drops of bromide solution will be beneficial.

Keep developing solutions cool and use more water in hot weather.

Do not use a cold developer in cold weather. The water may be decreased when the temperature is low.

For Non-Halation (double-coated) Plates, use about one-third more water; the development will be slower, but the results will justify the extra time spent in this way.

Pyro-Metol-Tolidol Developer.—"This is a good developer; some think it has no equal."—Eppert.

No. 1.

Sulphite of soda	testing 60°

No. 2.

Is made by mixing together equal quantities of

Carbonate of soda	testing 60°
Carbonate of potash	testing 60°

No. 3.

Water	11 oz.
Pyro	½ oz.
Metol	120 gr.
Tolidol	120 gr.
Citric acid	60 gr.
One ounce of No. 1 (sulphite testing 60°)	

To develop, take

Water	6 to 10 oz.
No. 1	½ oz.
No. 2	½ oz.
No. 3	2 to 4 drm

During the warm weather leave out the carbonate of soda in No. 2, using the carbonate of potash (testing 60 deg. by hydrometer) alone.

Metol and Hydrochinon Developer.

No. 1.

English weights and measures.	Metric weights and measures.
80 ounces of pure hot water	or 2400 c.cm.
1 ounce of metol	or 30 grm.
⅛ ounce of hydrochinone	or 4 grm.
6 ounces of sulphite of soda (crystals)	or 180 grm.

No. 2.

80 ounces of pure water	or 2400 c.cm.
5 ozs. of carbonate of soda (crystals)	or 150 grm.

To develop, take

2 ounces of pure water	or 60 c.cm.
1 ounce of Solution No. 1	or 30 c.cm.
1 ounce of Solution No. 2	or 30 c.cm.

Eikonogen-Hydrochinon Developer. As used on Hammer Plates by prominent photographers. Very fine.

No. 1.

English weights and measures.	Metric weights and measures
64 ounces pure water	or 1920 c.cm.
1 ounce of eikonogen	or 30 grm.
⅛ ounce of hydrochinon	or 4 grm.
2½ ozs. of sulphite of soda (crystals)	or 75 grm.

No. 2.

64 ounces of pure water ....or	1920 c.cm.
2½ ozs. of carbonate of potash (dry) or	75 grm.

To develop, take

2 ounces of Solution No. 1 ....or	60 c.cm.
1 ounce of Solution No. 2 ....or	30 c.cm.

And old developer (solution previously used) in sufficient quantity to produce best results.

Pyro and Metol Developer.

No. 1.

English weights and measures	Metric weights and measures.
57 ounces of pure water ....or	1710 c.cm.
2½ ozs. of sulphite of soda (crystals) or	75 grm.
1 ounce of metol ....or	30 grm.

No. 2.

57 ounces of pure water ....or	1710 c.cm.
2½ ounces of sulphite of soda (crystals) or	75 grm.
¼ ounce of pyrogallic acid ....or	8 grm.

No. 3.

57 ounces of pure water ....or	1710 c.cm.
2½ ounces of carbonate of potash ....or	75 grm.

To develop, take

3 ounces of pur water ....or	90 c.cm.
1 ounce of Solution No. 1 ....or	30 c.cm.
1 ounce of Solution No. 2 ....or	30 c.cm.
1 ounce of Solution No. 3 ....or	30 c.cm.

This developer may be used repeatedly, by adding a little fresh developer as required.

Keep the used developer in a separate bottle. It combines the desirable qualities of metol and pyro, and gives an ideal negative.

Acid Fixing Bath.

Owing to the quality of the water in some localities, some workmen prefer an acid fixing bath. The following is good and remains clear (mix in order given):

Water (about	120 oz.
Sulphuric acid	3 dr.
Sulphite of soda	4 oz.

When dissolved, add

Hyposulphite of soda....................	2 lb.
Water to make	160 oz.

Acid Chrome-Alum Fixing Bath.

This kind of a bath has been in use for years and is preferred by many (mix only in the order given):

Water (about)	100 oz.
Sulphuric acid	3 dr.
Sulphite of soda	4 oz.

When dissolved, add

Hyposulphite of soda	2 lb.

Dissolve and then add chrome-alum from 1 to 2 ounces, previously dissolved in 20 ounces of water. Then add water to make 160 ounces.

CRAMER PLATES.

Pyro-Acetone Developer.—Can be used in warm climates without ice. Does not stain the hands.

No. 1.

Pure Water	Hydrometer test 80	20 oz.
Cramer's dry sulphite of soda		3 oz.
Pyrogallic acid		1 oz

(½ oz. of Pyro and ½ oz. of Edinol may be used in place of 1 oz. pyrogallic acid.)

Use melted ice or boiled water cooled and filtered.

This solution works best while fresh. It can be used as long as it stays clear.

If it is to be kept along time, put it in bottles, quite full and tightly corked, to prevent discoloration.

No. 2.

Cramer's (liquid) acetone	1 oz.
Water	20 oz.

For use mix the following proportions:

No. 1	1 oz.
No. 2	10 oz.

Use enough developer to keep the plate well covered, and rock the tray gently while developing.

While plates can be developed in succession by discarding a part of the used developer, each time, and making it up to the original bulk with fresh.

Do not keep the plate out of the developer too long when examining it, or streaks will form.

While with other developers, the lights appear first and then the shadows; with this developer they appear simultaneously as though the plate had been over-exposed, but by continued development, the lights gain gradually in intensity and as soon as sufficiently dense, development should be stopped.

For short exposures use fresh developer, and, if negative shows under-exposure, transfer it without rinsing to a tray containing solution No. 2, until all the detail is out, then finish developing in the normal solution.

The development of over-exposed plates can be checked by the use of old developer, or by transferring them quickly to a tray containing a solution of bromide of potassium (1 to 50), and then back to normal developer.

For white drapery, place the plate first in a solution of bromide of potassium (1 to 50) for about half a minute, and then, without rinsing, transfer to normal developer.

When development is completed rinse the negative and place in the acid fixing and hardening bath.

If negatives turn yellow after fixing and washing, it is due to decomposition of the fixing bath.

Remedy: Make up a new bath.

Pyro Developer.

A.

		Metric.
Pure Water	16 oz.	640 c.cm.
Oxalic acid	12 gr.	1 grm.
Pyrogallic acid	1 oz.	40 grm.

B.

Pure Water	16 oz.	640 c.cm.
Cramer's dry sulphite soda	2 oz.	80 grm.

(Which will test 60° by hydrometer.)

If negatives are too yellow use more sulphite.

C.

Pure Water	16 oz.	640 c.cm.
Cramer's dry carbonate of soda	1 oz.	40 grm.

(Which will test 30° by hydrometer.)

If Cramer's dry carbonate of soda is used, solution C, as given above, is of the proper strength. When other brands are used it may be necessary to vary the strength of this solution, bearing in mind that an excess of carbonate blocks the lights, and increases contrasts.

Mix for immediate use.

A	1 oz.
B	1 oz.
C	1 oz.
Water (65° to 70° F.)	10 oz.

In summer the developer should be used cooler (about 60 deg. F.), or with more water.

In winter it should be used warmer (about 75 deg.), or with less water.

Less water hastens development and increases contrast.

More water slows development, gives less contrast and is better for short exposures.

Edinol Developer.

A.

		Metric.
Pure Water	30 oz.	900 c.cm.
Cramer's dry sulphite of soda.	2 oz.	60 grm.
(Which will test 32° by hydrometer.)		
Acetone-sulphite	¼ oz	8 grm.
Edinol	1 oz	30 grm.

B.

Pure Water	30 oz.	900 c.cm.
Carbonate of potassium	4 oz.	120 grm.

(Which will test 50° by hydrometer.)

For use:

A	1 oz.
B	1 oz.
Water	6 to 10 oz.

This developer can be used several times in succession, and keeps well.

Contrast Developer.—For developing over-exposed plates.

Also useful as an addition to normal developer in case same does not work with sufficient brilliancy, for which purpose the addition of a few drops is sufficient.

		Metric
Pure Water	30 oz.	1,500 c.cm.
Cramer's dry sulphite of soda	1 oz.	50 grm.
(Which will test 16° by hydrometer.)		
Edinol	100 gr.	10 grm.
Bromide of potassium	20 gr.	120 grm.
Carbonate of potassium	½ oz.	25 grm.

Use full strength.

This solution can be used repeatedly.

As soon as a plate shows over-exposure in the normal developer, rinse and place in the dish containing the contrast developer and develop until sufficiently intense.

Acid Fixing and Hardening Bath.

A.

		Metric.
Water (1 gallon)	128 oz.	4 litre.
Hyposulphite of soda	32 oz.	1 kilo.

(Which will test about 80° by hydrometer.)

B.

Water	32 oz.	1 litre.
Cramer's dry sulphite of soda. (Which will test 45° by hydrometer.)	3 oz.	90 grm.
Sulphuric acid C. P.	½ oz.	15 c.cm.
Powdered chrome alum	2 oz.	60 grm.

Note: Be sure to mix solution B *exactly* in given proportions and rotation.

Always pour B into A while stirring well. If this is not done precipitation will take place.

During the cold season one-half the quantity of Solution B is sufficient for full quantity of Solution A.

B can also be prepared as follows:

		Metric.
Water	32 oz.	1 litre.
Potassium metabisulphite	3 oz.	90 grm.
Powdered chrome alum	2 oz.	60 grm.

This bath remains clear after frequent use, does not discolor the negatives, and hardens the film to such a degree that the negatives can be washed in warm water and dried by artificial heat if necessary. They should be left in the bath ten to twenty minutes after the bromide of silver appears to have been dissolved to insure permanency, freedom from stain and perfect hardening.

If the bath becomes exhausted by continued use, replace it by a new one.

Plain Fixing Bath.

		Metric.
Water	32 oz.	1 litre.
Hyposulphite of soda (Which will test about 80° by hydrometer.)	8 oz.	250 grm.

Do not use the bath when it is discolored, it must be made fresh each day.

LUMIÈRE DRY PLATES.

Developer.

Lumière's Diamidophenol.

Water	1000 grms. or parts	32 oz.
Anhydrous sodium sulphite	30 " "	1 oz.
Diamidophenol	5 " "	15 gr.

Anhydrous sodium sulphite may be substituted for twice as much sodium sulphite in crystals.

The relative proportion of sulphite and diamidophenol may be measured in volume by using three parts of sulphite for one of diamidophenol.

A stock solution of sulphite may also be advantageously used, but it retains its strength only for a week, beyond that time its strength decreases gradually without any apparent change.

The following formula will be found to give good results:

Water	1000 grms. or parts	32 oz.
Anhydrous sodium sulphite	30 " "	1 oz.

For every ounce of the stock solution add at the time of use 2½ grains of diamidophenol.

This developer is remarkably rapid in action (3 to 4 minutes' development for a well-timed negative) and will be found especially valuable for the development of instantaneous exposures, while by regulating the proportion of sulphite to diamidophenol, great power of control is acquired. For under-exposure increase proportion of sulphite; for ever-exposure increase proportion of diamidophenol.

The solution is ready for use in a minute, and must be prepared just before use in order to have all its strength.

For black tones lantern slides, double the quantity of diamidophenol and add 5 grammes (or 75 grains) of a 10 per cent. solution of bromide.

For portrait work add twice as much water.

Pyro-Soda.

A—Pyro-Solution.

Pure Water	1000 grms. or parts	32 oz.
Pyrogallic acid	30 “ “	1 oz.
Oxalic acid	1 “ “	15 gr.

B—Soda-Solution.

Water	300 grms. or parts	10 oz.
Carbonate of soda (dry) (1)	30 “ “	1 oz.
Anhyd. sodium sulphite (1)	75 “ “	5½ gr.

Anhydrous sodium sulphite may be substituted by twice as much sodium sulphite in crystals.

Dry carbonate of soda may be substituted by two to three times as much carbonate in crystals.

For immediate use take

A	30 c. c. or grms.	1 oz.
B	30 c. c. “	1 oz.
Water	150 to 250 c. c. “	5 to 8 oz.

or by hydrometer:

A	30 c. c. or grms.	1 oz.
Sodium sulphite solution (test 60)	60 c. c. “	2 oz.
Carbonate of soda (test 40)	30 c. c. “	1 oz.
Water	100 to 200 c. c. “	3 to 6 oz.

The quantity of water should be regulated according to result desired, the more water the finer gradation and detail. In warm weather use developer diluted and cool (temperature not over 60 F.)

Bromide may be used as a restrainer.

Fixing.—After rinsing, the plate should be immersed in the following fixing bath and allowed to remain a few minutes after all milky patches have disappeared from the back:

Water	1000 grms or parts	32 oz.
Hyposulphite of soda	250 “ “	8 oz.
Bisulphite of soda	25 “ “	1 oz.

or preferably:

Water	1000 grms. or parts	32 oz.
Lumière's fixing salts	1 package.	

In hot weather add 40 grammes or parts of alum, and use the solution twenty-four hours after making.

Washing should be thorough in order to remove all traces of hypo, either in running water for two hours, or a succession of changes, or by using a hypo eliminator. This latter method is rapid, certain and effective, if Lumière's Thioxydant be employed.

EASTMAN'S NON-CURLING FILM.

Those who are accustomed to the use of the regular films should bear in mind the following facts when manipulating Eastman's N. C. Film:

1. N. C. Film being coated on the back with gelatine, neither side must come in contact with anything while drying. Note special directions for drying.

2. As N. C. Films are very rapid and are orthochromatic they should be handled carefully in the dark room with safe ruby light, or developed in either the Kodak Tank Developer or Kodak Developing Machine to avoid fogging.

3. N. C. Film will not curl and the glycerine bath is, therefore, entirely unnecessary.

4. N. C. Films must be fixed in an acid fixing bath or else immersed in an alum bath after fixing.

Preparing for Development.—For best results use the Kodak Tank Developer or the Kodak Developing Machine. The acid fixing bath must be used or films must be soaked in alum bath for fully five minutes and dried as per directions herein. Those who prefer the dark-room method of development should, however, proceed as follows:

The development of cartridge films in the strip. The operator can readily handle a 12 exposure strip up to and including the 3¼x4½ size. In the larger sizes those desiring to follow the strip method of development should use the 6 exposure cartridges if they find the longer ones cannot be conveniently handled.

Strip Development.

1. Unroll the film and detach the entire strip of film from the black paper, taking care not to touch the face of the film in so doing.

2. Pass the film, face down, through the tray of clean, cold water, holding one end in each hand. Pass through the water several times, that there may be no bubbles remaining on film. When it is thoroughly wet, with no air bubbles, place the strip or film in a pail or wash-bowl of clean, cold water, which is large enough so that the film may be immersed fully without folding tightly enough to crack it.

3. Now prepare the developer and pass the film through it in the same manner as described for wetting it. Keep it constantly in motion, and in about one minute the high-lights will begin to darken, and you will readily be able to distinguish the unexposed sections between the negatives. Complete development in the strip, giving sufficient length of development to bring out what detail you can in the thinnest negatives. There is no harm in having your negatives of different density —this can be set right in the printing. The difference in density does not affect the difference in contrast.

Pyro Formula.

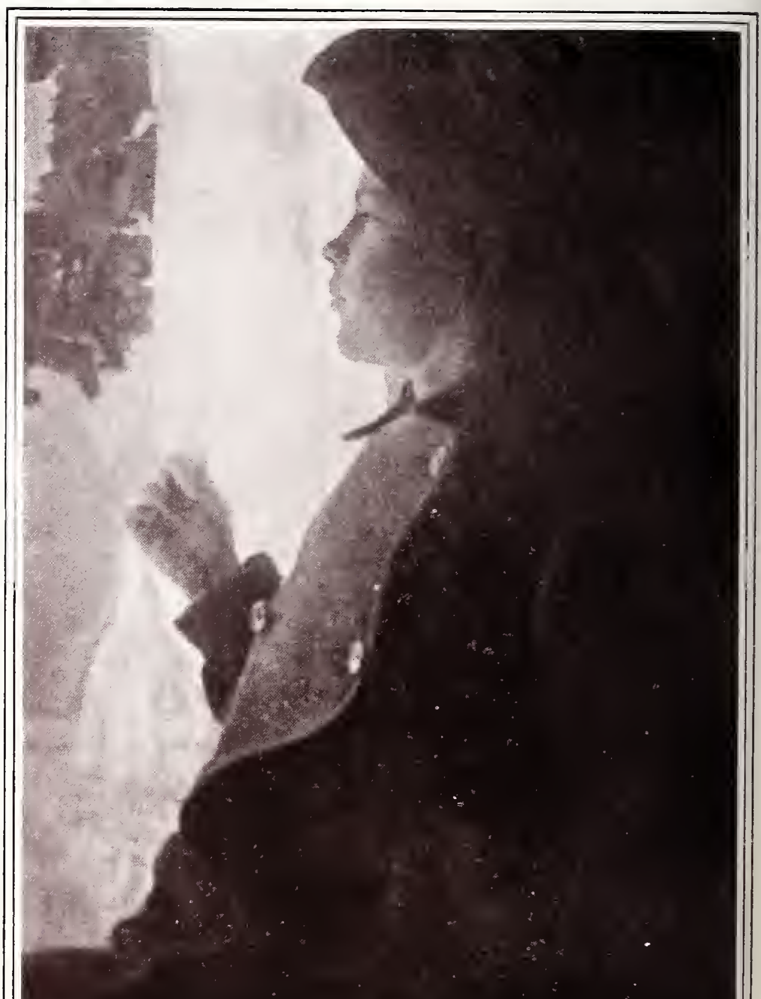
Pyrogallic Acid Solution.

Pyrogallic acid	1 oz.
Sulphuric acid	20 min.
Water	28 oz.

Soda Solution.

*Sulphite of soda (anhydrous)	3 oz.
*Carbonate of soda (anhydrous)	2 oz.
Water	28.

*If "crystals" are used double the quantity.



CHRISTMAS DREAMS
Fedora E. D. Brown

For dark-room development take:

Pyro solution	½ oz.
Soda solution	½ oz.
Water	4 oz.

(This developer will then contain 1.56 grains Pyro per ounce.)

For Kodak Developing Machine (6 minute development), or Kodak Tank Developer (10 minute development) take the following proportions:

Pyro solution	1 oz.
Soda solution	1 oz.
Water	10 oz.

(This developer will then contain 1.30 grains Pyro per ounce.)

For Kodak Tank Developer (20 minute development) take the following proportions:

Pyro solution	1 oz.
Soda solution	1 oz.
Water	22 oz.

(This developer will then contain .65 grains Pyro per ounce.)

Fixing Bath.

Kodak Acid Fixing Powder	4 oz.
Water	16 oz.

Or the acid fixing bath may be prepared as follows if desired:

Water	16 oz.
Hyposulphite of soda	4 oz.
Sulphite of soda (anhydrous)	80 grs.

When fully dissolved add the following hardener:

Powdered alum	⅛ oz.
Citric acid	⅛ oz.

This bath may be made up at any time in advance and may be used so long as it retains its strength, or is not sufficiently discolored by developer carried into it as to stain the negatives.

If a plain hypo bath be used the negatives must be rinsed in three changes of water and transferred to a saturated solution of common alum for full five minutes, then washed. This aplies also, of course, to machine or tank developed negatives.

Notice. All photographic chemicals are bought and sold by avoirdupois and above formulæ are prepared accordingly.

Drying N. C. Film Negatives.—When thoroughly washed, remove the surplus water from the negatives with a squeegee of soft, damp cloth. Another easy method, when negatives are developed in the strip, is to draw the first one side up and then the other across the smooth edge of either a porcelain or enameled bath tub, or, for that matter, across any smooth, rounding surface, such as the edge of a china wash bowl. Be sure to remove *all surplus moisture and* tear drops" before hanging up to dry.

Having removed the surplus water, snap an Eastman Film Developing Clip on each end of the strip and hang it up to dry, being sure that it swings clear of the wall so that there will be no possibility of either side of the film coming in contact with the latter. In drying, N. C. Film should be cut into strips of *not more* than six exposures in length.

If the film has been cut up, pin one corner to the edge of a shelf or hang the negatives on a stretched string by means of a bent pin, running the pin through the corner of the film to the head, then hooking it over the string.

Always keep finished negatives flat—*do not roll them up.*

ANSCO NON-CURLING CARTRIDGE FILM.

The development of Ansco Non-Curling Film does not differ very much from the regular Film. The same developer may be used; but it must be fixed in an Acid Fixing Bath or immersed in the Alum Bath previous to washing in order to avoid stains, and also to harden the gelatine coating on the back of the Film, especially during hot weather.

The difference between the regular Film and the Non-Curling Film can be summed up as follows:

Ansco Non-Curling Film will not curl and the glycerine bath is therefore entirely unnecessary.

Non-Curling Film being coated on the back with gelatine, neither side must come in contact with anything while drying.

Non-Curling Film must be fixed in an Acid Fixing Bath or else immersed in an Alum Bath after fixing.

Developing.—Ansco Non-Curling Film may be developed either in the strip or cut into one or more exposure lengths.

To develop in the strip remove the film from the black paper, allowing film to roll up loosely. Hold this roll by the end with thumb and second finger of the left hand, and take hold of the free end of the film with the right. Place the film in the developer, which has been previously prepared, and at once begin to pull the film from the roll, holding the film down in the developer with the index finger of the left hand. When the whole length has been unrolled, take hold of the last end of the film with the left hand and pass it back and forth through the developer until the development is completed.

To avoid transparent spots, as soon as the film has been passed through the developer the first time, face down, reverse it face up, and holding the film down in the tray, draw the film through the developer under the hand. This breaks all the air bubbles and a perfect negative will result. Transparent spots are caused by air bubbles adhering to the film development.

When fully developed rinse in water and immerse in the fixing bath, or if a small tray is used, pass film through fixing bath in the same manner as in development until the white appearance has entirely disappeared. The film strip may now be washed and hung up to dry, according to special directions for drying.

Much time and trouble is saved by this method, and the results, even with widely different exposures, compare favorably with those obtained by developing the film separately, although the most exacting results are to be obtained by developing the films separately.

To develop in one or more exposure lengths, separate the film into lengths by cutting through the points indicated on the black paper. Place the films in the developer one at a time, face down, and move each one about so that all air bubbles may be broken before another film is added. In this manner six or more pieces may be developed at one time.

When development is completed, wash in two changes of water and fix the same as strip development. Wash half an hour in running water, or in eight or ten changes of water, and hang up to dry as recommended in special directions for drying.

Machine Development.—The Ansco Film Cartridges are ready prepared for machine development by means of a patented device.

This device consists of a lock cut in the end of the film and longitudinal slots in the black paper. The slots allow the film to move freely enough to prevent bunching in the camera and yet hold the film sufficiently secure to the black paper for machine development. This method of fastening the film to the black paper obviates the necessity of unwinding the black paper after exposure to fasten the free end of the film.

Drying Non-Curling Films.—Attach an Ansco Film Clip to each end of the film and hang it up on a line, being careful that neither side comes in contact with anything.

In practice it is found desirable to remove the surplus water from the emulsion side of the film. This may be done with a squeegee or by drawing the emulsion side of the film across the smooth edge of a tray, or any other rounded surface.

In drying Non-Curling Films, they should be cut up in strips of not more than six exposures in length.

If the film has been cut up, pin by one corner to the edge of a shelf or hang the negatives on a stretched string by means of a bent pin, running the pin through the corner of film to the head, then hooking it over the string.

Always keep finished negatives flat. Do not roll them up.

Developing Formulæ.

Metol-Hydro.

2000 c. c.	Water	60 oz.
4 grms.	Metol	60 gr.
125 grms.	Soda sulphite (granulated)	4 oz.
60 grms.	Soda carbonate (granulated)	2 oz.
2 grms.	Hydrochinon	30 gr.
1-3 grms.	Potash bromide	5 gr.

Add chemicals in the order given.

Pyro.—No. 1.

Water	24 oz.
Soda sulphite (crystals)	2 oz.
Citric acid	60 gr.
Bromide ammonia	20 gr.
Pyrogallic acid	1 oz.

No. 2.

Water	24 oz.
Soda sulphite (crystals)	2 oz.
Potash carbonate	3 oz.

For exposures correctly timed, mix No. 1, 1 dram; No. 2, 1 dram water, 2 oz.

Fixing Bath.

Water	16 oz.
Hyposulphite soda	4 oz.
Sulphite soda (anhydrous)	80 gr.

When fully dissolved, add the following hardener:

Powdered alum	⅛ oz.
Citric acid	⅛ oz.

If a plain hypo bath be used, the negatives must be rinsed in three changes of water and transferred to a saturated solution of common alum for full five minutes, then washed.

GENERAL FORMULAE FOR DRY PLATES

PYROL

Formula for Seed Plates.

No. 1.

Distilled or good well water	16 oz
Sulphite soda	4 oz.
Pyrol	1 oz.
Sulphuric acid	10 drops

No. 2.

Water	16 oz.
Sal soda (crystals)	4 oz.

To develop, take

No. 1	1 oz.
No. 2	1 oz.
Water	8 oz.

Formula for Cramer Plates.

No. 1.

Water	6 oz.
Sulphite soda	1 drm.

Add acetic acid to turn Litmus Paper red, and then add

"Pyrol"	1 oz.

No. 2.

Water	60 oz.
Carbonate soda (crystals)	5 oz.
Sulphite soda	10 oz.

To develop, take

No. 1	1 drachm.
No 2	1 oz.
Water	3 to 4 oz.

Formula for Stanley Plates.

No. 1.

Water	80 oz.
Sulphite soda, (crystals).	6 oz.
Carbonate soda (crystals)	6 oz.

No. 2.

Water	80 oz.
Sulphuric acid	½ drachm.
"Pyrol"	1 oz.

To develop, take equal parts of No. 1 and No. 2.

Bothamley's Pyro Developer. A. Stock Pyro Solution.

Metabisulphite of potassium	1 oz.
Water	8 oz.
Pyrogallic acid	1 oz.
Water	to make 10 oz.

B

Stock pyro solution	1 oz.
Water	10 oz.

C

Carbonate of sodium crystals	1 oz.
Sulphite of sodium	1 oz.
Bromide of potassium	10 gr.
Water	to make 10 oz.

For use mix equal parts B and C.

A SUNLIT POOL

Louis Fleckenstein

Imperial Standard Developer. A

Metabisulphite of potassium	120 gr.
Pyrogallic acid	55 gr.
Bromide of potassium	20 gr.
Metol	45 gr.
Water	20 oz

B

Carbonate of soda	4 oz
Water	20 oz

For use mix equal parts A and B.

Bardwell's Pyro-Acetone Developer.

Water	4 oz.
Sulphite of sodium (saturated solution)	4 dr.
Acetone	2 dr.
Pyro	10 grms.

Metol.

Solution A.

Water	32 oz.
Metol	4 drm.

When dissolved add

Sulphite soda (crystals) (or C. P. dry 2½ oz.)	5 oz.

Solution B.

Water	32 oz.
Carbonate soda (crystals) (or C. P. dry 2½ oz.)	5 oz.
Bromide potassium	25 gr.

For use take equal parts A and B.

One Solution Developer.

Water	32 oz.
Metol	4 drm.

When dissolved add

Sulphite soda (crystals) (or C. P. dry 2½ oz.)	5 oz.
Carbonate potash	5 drm.
Bromide potassium	15 gr.

For use take 1 part developer and add 1 to 2 parts water.

Ortol Developer.

Solution A.

Water	20 oz.
Metabisulphite of potassium	65 gr.
Ortol	135 gr.

Solution B.

Water	20 oz.
Carbonate soda (crystals) (or C. P. dry 1¼ oz.)	2½ oz.
Sulphite soda (crystals) (or C. P. dry 1 oz. 6 drm.)	3¾ oz.
Bromide potassium	8 gr.

For use take equal parts A and B and an equal bulk of water.

Glycin Developer.

Hot water	20 oz.
Sulphite soda (crystals)	5 oz.
(or C. P. dry 2½ oz.	
Carbonate potash	5 oz.
Glycin	1 oz.

Dissolve in the hot water in order given. For use take 1 part solution of bromide potassium if there is any tendency to fog.

Adurol-Hauff. One solution.

Water	10 oz.
Sulphite of sodium (crystals)	4 oz.
Carbonate of potassium	3 oz.
Adurol	½ oz.

Two solution.

Solution A.

Water	20 oz.
Sulphite soda (crystals)	4 oz.
(or C. P. dry 2 oz.)	
Adurol	175 gr.

Solution B.

Water	20 oz.
Carbonate potash	2½ oz.

For use take 1 part A, 1 part B and 1 part water. In hot weather, or when plates are inclined to fog, add 5 to 10 drops of 10 per cent. solution of bromide potassium.

Hydrokonone-Hauff.

Solution A.

Water	10 oz.
Sulphite soda (crystals)	2 oz.
(or C. P. dry 1 oz.)	
Hydrokinone	40 gr.

Solution B.

Water	10 oz.
Carbonate potash	1¼ oz.

For use take equal parts A and B. Add a few drops of 10 per cent. solution of bromide potassium if there is any tendency to fog.

Hydrokinone. One solution.

Water	10 oz.
Sulphite soda (crystals)	2 oz.
(or C. P. dry 1 oz.	
Hydrokinone-Hauff	½ oz.
Carbonate potash	4 oz.
Bromide potassium	10 gr.

For use take 1 part solution and add 4 to 6 parts water. This developer keeps well and can be used repeatedly.

Formulæ for Transparencies and Lantern Slides.

Black Tones.

Water (distilled)		20 oz.
Hydrokinone Hauff		60 gr.
Sulphite soda	dry	1 oz., or
	crystals	2 oz.
Carbonate soda	dry	3 oz., or
	crystals	6 oz.
Bromide potash		40 gr.

For Imperial Lantern Plates—No. 1.

Hydrokinone-Hauff	150 gr.
Metabisulphite potash	10 gr.
Bromide potash	50 gr.
Water	20 oz.

No. 2.

Sulphite soda	dry	1 oz., or
	crystals	2 oz.
Caustic soda		100 gr.
Water		20 oz.

For use take equal parts Nos. 1 and 2.

Metol-Hydrokinone Formula for Lantern Plates.

Metol-Hauff		¼ oz.
Hydrokinone-Hauff		¼ oz.
Water (boiled)		80 oz.
Sulphite soda	dry	2 oz., or
	crystals	4 oz.
Carbonate soda	dry	1¼ oz., or
	crystals	2⅛ oz.

For use take 2 parts developer and add 1 part water. For greater softness increase quantity of water, or use without dilution if contrast is required.

Imogen Developer.

A

Hot water	9 oz.
Sulphite of sodium crystals	385 gr.
Imogen	123 gr.

B

Hot water	4½ oz.
Carbonate of sodium	2 oz.

For use take 2 ounces A and 1 of B.

Diogen Developer.

Water	9 oz.
Sulphite of sodium	3½ oz.
Diogen	7 dr.
Carbonate of potassium	4½ oz.

For normal exposure take 4 drams of this solution; dilute with ounces, 1 dram of water, and add 2 drops bromide of potassium 10 per cent. solution.

Metacarbol Developer.

Metacarbol	25 gr.
Sulphite of soda crystals	100 gr.
Caustic soda	50 gr.
Water	10 oz.

Dissolve the metacarbol in water, then add the sulphite, and when dissolved add the caustic soda and filter.

INTENSIFIERS AND REDUCERS.

Intensifier (Mercuric) with Sodium Sulphite, for Gelatine Dry-Plates.

Whiten the negative in the saturated solution of mercuric chloride, wash and blacken with a solution of sulphite of sodium 1 in 5. Wash well.

The reduction is perfect, with a positive black tone.

Intensifier with Iodide of Mercury.

Dissolve 1 drachm of bichloride of mercury in 7 ounces of water and 3 drachms of iodide of potassium in 3 ounces of water, and pour the iodide solution into the mercury till the red precipitate formed is completely dissolved.

For use, dilute with water, flow over the negative till the proper density is reached, and wash, when the deposit will turn yellow. Remove the yellow color by flowing a 5 per cent. solution of hypo over the plate, and give it the final washing.

Agfa Intensifier.

One part of Agfa solution in 9 parts water (10 per cent. solution). Immerse negative from 4 to 6 minutes.

Reducer for Gelatine Dry-Plate Negatives (Farmer's).

Sat. sol. of ferricyanide of potassium	1 part
Hyposulphite of sodium solution, 1 in 10	10 parts

Reducer for Gelatine Dry-Plates.

Perchloride of iron	30 gr.
Citric acid	60 gr.
Water	1 pint

Belitski's Acid Ferric-Oxalate Reducer for Gelatine Plates.

Water	7 ounces
Potassium ferric oxalate	2½ drachms
Crystallized neutral sulphite of sodium	2 drachms
Powdered oxalic acid, from	30 to 45 gr.
Hyposulphite of soda	1½ ounces

The solution must be made in this order, filtered, and be kept in tightly-closed bottles; and as under the influence of light the ferric salt is reduced to ferrous, the preparation must be kept in subdued light, in non-actinic glass bottles.

Orthochromatic Dry-Plates — Erythrosine Bath (Mallman and Scolik).

Preliminary Bath.

A.—	Water	200 C.c.
	Stronger ammonia	2 C.c.

Soak the plate for two minutes.

Color Bath.

Erythrosine solution, 1 in 1000	25 C.c.
Stronger ammonia (0.900)	4 C.c.
Water	175 C.c.

The plate should not remain longer in this bath than one and a quarter minutes.

PRINTING PROCESSES.

Sensitizing Plain and Albumen Paper.—The usual method of rendering paper of any kind sensitive to light is to float it for a varying length of time on a solution of silver nitrate, having previously salted it, if it be plain paper, with some chloride, usually chloride of ammonium. In practice it has been found that the strength of the silver bath should not fall below thirty grains of silver to the ounce of water, lest the albumen be dissolved; and that, save in exceptional cases, there is no need of a greater strength than sixty to sixty-five grains to the ounce. The precise strength necessary to produce the best results with any given brand of albumen paper depends upon the amount of chloride used in salting; a paper weak in chloride requiring a weak bath, while one rich in chloride demands a strong one.

Formulæ for Sensitizing Bath. For very Strong Negatives.

No. 1.

Silver nitrate	35 gr.
Water	1 oz.

Print in full sunlight.

For Thin Negatives.

No. 2.

Silver nitrate	80 gr.
Water	1 oz.

Print in the shade.

No. 3.

Silver nitrate	60 gr.
Ammonium nitrate	60 gr.
Ammonia	2 mms.
Water	1 oz.

For prints on plain, resinized, gelatinized paper and leatherized paper:

No. 4.

Silver nitrate	60 gr.
Gelatine	5 gr.
Water	1 oz.

C. W. Hearn's Formula.

No. 5.

Nitrate of silver	40 gr.
Distilled water	1 oz.

To every twenty ounces of solution add one dram of saturated solution of carbonate of soda. The bath will at once assume a creamy color; allow the solution to settle, then decant and filter. Carbonate of silver will deposit in the bottle, and this will take the organic matter from the bath and prevent it from discoloring. Allow the carbonate to remain in the bath, pouring the solution back upon after using. Then shake well and the bath will soon be ready for use again.

Keep the bath up to its full strength and occasionally add a few drops of the carbonate of soda solution.

Floating the Paper.—There should be enough of the bath poured in to cover the bottom of the pan to a depth of at least half an inch, and it should have been most carefully freed from all impurities before the sensitizing is begun. Impurities and air-bubbles are the two great enemies of the sensitizing room. Grasp the paper by the two opposite corners, albumen side down, bring the hands together, and lower the convex side to the surface of the bath; separate the hands, and the paper will float on the surface. If it shows an obstinate tendency to curl up, gently breathe upon it. This difficulty may be overcome by placing the paper, the night before sensitizing, in a damp place. Now raise one corner and look for air-bubbles. If any are found, break them with the point of a glass rod, and again lower the paper. When it has floated the proper length of time, from one to three minutes being the usual time, raise it by one corner very slowly, until another corner is free, which is then grasped by the other hand and the paper slowly withdrawn, allowed to drain a minute into a dish, and hung up by one corner to dry in the dark, or yellow light.

Points in Sensitizing. 1. Have the paper damp before silvering.

2. Before floating ascertain the condition of the bath as to strength and alkalinity.

3. Do not allow the paper to become bone-dry before printing if you wish to have rich prints. Of course, it must be dry enough not to adhere to the negative; anything more than this is not only useless, but fatal to securing the best results.

Toning Solution. 1. Stock Solution.

A.

Chloride of gold	1 gr.
Water	20 oz.

B.

Acetate of soda	15 gr.
Water	1 oz.

C.

Saturated solution of sulphate of copper.

When solution is complete, add B to A, and add 10–15 drops of C, allow to stand at least 24 hours before using. Tone only until the half tones are somewhat bluish by reflected light.

This bath will keep.

Tungstate of Soda Formula.

Chloride of gold	1 gr.
Tungstate of soda	20 gr.
Boiling water	8 oz.

Ready for use, as soon as cold. Keeps well.

Phosphate of Soda Formula. For Rich Purple Tones.

Phosphate of soda	20 gr.
Chloride of gold	1 gr.
Water	8 oz.

Ready for instant use; but does not keep well.

Platinum Bath Formula.

Bichloride of platinum solution	30 drops.
Hypo	8 gr.
Hydrochloric acid (C. P.)	5 drops.
Water	5 oz.

The platinum solution is made by dissolving enough of the salt in one ounce of water to give it a rich, sherry color, a few grains will suffice. This bath is slow, but good. It should be warmed to 70 deg. Fahr., and the free silver should be well washed out of the prints.

Borax Box Formula.

Chloride of gold	1 gr.
Borax	30 gr.
Boiling water	8 oz.

Ready for use when cooled down to 60 deg. Fahr. Gives rich brown tones, and keeps well. An excellent bath for ready-sensitized paper.

For Sepia and Black Tones.

Chloride of gold	2 gr.
Sat. sol. chloride lime	2 drops.
Chalk (precipitated)	3 gr.
Boiling water	16 oz.

The chloride of lime solution is made by shaking a teaspoonful of the chloride in a pint-bottle full of water. When the solids have settled, decant the clear portion, which should be kept in the dark.

Allow the bath to stand at least a day before using. It improves with age.

For sepia, tone but very little, just off the red; for a black tone, to a deep purple.

Hearn's Sal Soda Formula.

Distilled or ice water	64 oz.
Acid sol. of chlo. of gold (4 grs. to 1 oz.)	1 oz.
Saturated solution of sal soda	½ oz.

Should be prepared one-half hour before use.

Hearn's Chloride of Lime Formula.

Water	40 oz.
Chloride of lime	5 gr.
Chloride of gold	4 gr.

If the chloride of gold is acid, it may be neutralized with carbonate of lime.

For resinized, gelatinized, leatherized, and plain paper:

Stock Solution.

Gold chloride	15 gr.
Water	7½ dr.

To make the bath, add two drams of the gold solution neutralized with a pinch of chalk, to ten ounces of hot water. Place two drams of acetate of soda in a quart bottle, and filter the above solution into it; make the bulk up to twenty ounces. This bath can be used in a few hours, but it improves by keeping.

Fixing Bath.

Hyposulphite of soda	4 oz.
Water	20 oz.
Ammonia	½ dr.

Printing on Plain Paper. Prepare the plain paper with

Ammonium chloride	60 to 80 gr.
Sodium citrate	100 gr.
Sodium chloride	20 to 30 gr.
Gelatine	10 gr.
Distilled water	10 oz.

or,

Ammonium chloride	100 gr.
Gelatine	10 gr.
Water	10 oz.

The gelatine is first swelled in cold water and then dissolved in hot water, and the remaining components of the formula are added. The solution is filtered, and when still warm the paper floated upon it for three minutes.

The salted paper is sensitized upon a neutral 45-grain silver bath

Platinum Toning Bath, for Plain Silver Prints.

Chloroplatinite of potassium	1 grm.
Water	1 liter.
Nitric acid	5 to 10 drops.

Toning Silver Prints After Fixing (Pizzighelli).

Ammonium sulphocyanate	300 grm.
Gold chloride	3 grm.
Potassium hydrate	3 grm.
Water	1000 grm.

READY SENSITIZED PAPER.

ARISTO PLATINO.

Directions.—The printing of Aristo Platino for platinum toning should be very deep, tinting the high-lights considerable. Pay no attention to bronzing in shadows, that will all tone out.

Prints should be washed through five changes of cold water.

When sufficiently washed and ready to tone, the prints are first placed in a plain gold-toning bath, made slightly alkaline with borax. The bath should contain sufficient gold to tone in from 5 to 8 minutes, and will work better if made up 2 or 3 hours before using. The toning should be carried in this bath to a medium purple. This is probably rather indefinite, but after one or two trials there will be no difficulty in determining the proper tone.

If the prints are not sufficiently toned in the gold bath, leaving the deeply printed parts quite red, it will be necessary to over-tone in the platinum bath to remove the red, and the result will be a green or olive black in the finished print. When the toning of gold bath has been carried to the right point, a pure black tone will be reached in platinum bath at about the same time that the last trace of warmth disappears. A little of the olive tone is not objectionable. On the contrary, it is rather pleasing.

After the gold toning, prints are given two changes of water and toned in a platinum bath made of Aristo Platinum solution, according to instructions on bottle.

The bath should be made up a couple of hours before using, and during cold weather, or at any time when the water used is quite cold should be slightly warmed to take the chill off. When the prints are first placed in the platinum bath, the tone changes to a deep purple or purple black, then to a pure black, and, if left in the bath too long, will have the green or olive black before referred to.

When a large number of prints are being toned at one time and a check bath is necessary, place the prints as they come from the platinum bath in water made slightly alkaline with carbonate of soda.

After the platinum toning give prints two more changes of water, and fix 10 minutes in a fresh fixing bath 18 hydrometer test.

Final wash, 1 to 1½ hours in running water. If a syphon washing tank is used, there should be a change of water at least every 5 minutes and the syphon should empty the tank completely each time.

Mount with plain starch paste and lay prints out on a drying rack to dry. If the weather is damp and drying is slow, a little fire in finishing room will be a good thing. When thoroughly dry, run prints through a cold burnisher to shape the mounts.

BROADWAY ON A RAINY NIGHT
Dr. Albert R. Benedict

ARISTO COLLODIO-CARBON.

(For Black and White Tones.)

Printing.—Print until the high-lights are well tinted, about the same as you would print Aristo Platino. Too light printing gives weak and flat-looking prints when finished.

Washing.—Wash prints thoroughly in 8 changes of water, separating prints constantly in each water.

Gold Bath.

Water	64 oz.
Aristo Gold No. 2	1 drm.
Acetate of soda (saturated solution)	1 oz.
Borax (saturated solution) enough to turn red litmus paper blue in one or two minutes.	

This bath should be made up four or five hours before using. Add gold enough to keep speed of bath eight to ten minutes. Watch the bath closely to see that the high-lights do not bleach. If they show this, add more alkali, regardless of the color of the litmus paper. Tone prints in this bath to a purple, but in no case tone as far as a blue. After toning place the prints in an acid stop water of 3 ounces Acetic Acid No. 8 to each gallon of water.

Caution.—If prints are toned too fast in gold bath they will be flat. The whites should be thoroughly cleared and brilliant when they come from the gold bath. Too much alkali will give flat prints and muddy whites.

Washing after Gold Bath.—Wash prints in 4 changes of clear water, handling prints over in each water to thoroughly eliminate any alkali from gold bath and free gold that may remain in the print. After prints are washed tone in the following bath:

Platinum Bath.

Water	54 oz.
Aristo platinum (full strength)	3 drm.

Tone in this bath until the whites are thoroughly cleared, and all trace of color is out of the deepest shadows. After prints are toned, wash through two changes of clear water; to the third water add 2 ounces saturated solution of borax (crystals) to the gallon. Handle the prints in this alkali solution for ten minutes, then wash carefully through three changes of clear water, and fix in the following bath:

Fixing Bath.—Hyposulphite of soda, 18 grains hydrometer test, or 2¼ ounces hypo crystal to 32 ounces of water. Fix fifteen minutes. Prints should be handled constantly to insure thorough fixing. After prints are fixed, place in salt bath, six ounces salt to one gallon of water, for five minutes, and then into washing water.

Final Washing.—Washing after fixing is much more important with Collodio-Carbon than with any other paper. Owing to the weight and thickness of the stock it should be carefully washed through sixteen changes of clear water, handling each print separately; then wash for one hour in running water and they are ready to mount or dry.

1. In washing Collodio-Carbon paper, plenty of water should be used in the trays. In the winter the chill should be taken off the water. Bath of good depth should always be used. Insufficient washing gives flat, muddy prints. Owing to the heavy stock on which the emulsion is coated, prints should have at least twice the number of wash waters before toning, between toning baths and hypo, and after hypo, as is required for platino prints.

2. Prints should tone in gold bath to thoroughly clear the whites,

and should not tone too fast, six to eight minutes being fast enough, as too fast toning gives flat prints. Too much alkali in the gold bath gives muddy prints and yellow whites; too little gives pink whites. Taking prints from gold bath too warm in color gives olive tones when dry. Toning too far gives blue black. A ripened gold bath will always give better results than a fresh one. Do not use an old gold bath.

3. If prints are not thoroughly washed between gold and platinum bath, and between platinum and hypo baths, it will cause muddy whites.

4. If prints show blue in platinum bath, and they have not been toned too far in the gold bath, reduce the speed of the platinum bath by adding water and warm the bath slightly. If they show too much olive, strengthen the platinum bath.

5. Should the whites show bleaching or cutting out in the hypo bath, add enough of the saturated solution of borax so that red litmus paper will turn blue in one minute.

6. Prints on Collodio-Carbon will dry a shade darker in tone, and should show a slight trace of olive in wash water for black tones when dry.

7. After prints are dry they can be straightened by damping slightly on back with a sponge and then putting under slight pressure until dry, when they may be trimmed and mounted.

ARISTO PLATINO BACKING.

For Backing Platino Photographs.—This paper is made upon the same pure raw stock, and is coated with the same pure collodion emulsion, as used for Aristo Platino, except that it contains no silver.

The object of using Aristo Platino Backing paper is to make the finished prints lie perfectly flat. By squeegeeing the prints face down, upon glass, and mounting backing paper on to them, thus bringing the collodion emulsion to the *outside* of both print and backing, the finished picture draws both ways practically the same, and therefore cannot curl or cockle.

Directions.—After the prints have been finally washed, take them one by one from the final washing water, and squeegee, face down, on clean glass. Paste the backing paper instead of the print. Then mount the backing paper over the print on to the glass, being careful to rub it down smooth, rubbing it from the centre toward the margin.

The backing paper should be one inch larger than print, so that when it is mounted over the print on the glass it will leave a margin of half an inch all around the print where the backing paper adheres directly to the glass, thus holding the print in perfect contact with the glass until it is bone dry, when the print may be cut from the glass with a sharp knife and trimmed. The margin of backing paper which remains on the glass can be readily removed with hot water, and the glass made ready for another print. Each glass may be made to do double service by mounting a print as above described on each side, thus: Squeegee a wet print on to one side of the glass, turn it over and lay on a clean blotter, then squeegee a print on the other side. Mount backing papr over this print, then turn the glass over again and mount backing over the print on the other side, and place glass in a rack to dry.

If small prints—for instance, cabinet size—are being made, twelve prints can be squeegeed to one glass as follows: Take a 14x17 glass, perfectly clean on both sides, place six cabinet prints on one side close together, being careful not to allow any one print to overlap another. Squeegee, then turn the glass over with these prints on, laying on a clean blotter, and squeegee six prints on the other side. Then mount a piece of backing paper, 12x13 inches in size, over the whole six prints. This will allow at least half an inch margin of backing paper to adhere to the glass around the edges of the six prints. Then turn the glass over again and mount a piece of backing paper over the other six prints, and place the glass with the twelve prints mounted on it in a rack to dry.

Notes.—1. In preparing the backing paper it must be understood that the emulsion of this paper contains preserving acids which must be removed before use. It is therefore necessary to wash through four changes of water, about five minutes to each change. Then, in order to have this paper as thoroughly wet as the prints are when they are squeegeed, the backing paper should be allowed to soak during the toning and washing of the prints.

2. In cutting the backing paper care should be used to see that the grain of the paper in the backing runs the same way in the sheet as the grain of the paper in the print. This may be ascertained by cutting off a piece, say, two by three inches and throwing into a tray of water. If it turns up at the sides the grain runs the long way; if it turns up at the ends the grain runs crosswise. In other words, see that the print and the backing curl the same way of the sheet. This is necessary in order to insure the print lying flat, for if the grain of the backing paper should run crosswise of the grain in the print, the finished print would curl slightly. Always cut the backing paper one inch larger than the print or set of prints it is to cover, so as to allow half an inch of margin that will adhere directly to the glass.

3. In squeegeeing prints the proper tool to use is a plain, flat, soft rubber squeegee, sold by all dealers at a nominal price. (A roller squeegee is not practical for this purpose.)

4. Care should be taken to see that all surplus water on the margin of glass around the edges of print or prints is carefully removed before mounting the backing paper to it. A drop of water carelessly left on the glass would interfere with the adhesion and cause the print to cockle at that point.

5. Prints should be allowed to dry slowly at first until the paste is thoroughly set, or until they are about half dry, then the drying may be hastened by artificial heat.

6. It has been found in squeegeeing several prints at a time, for instance, six cabinets on one glass, that occasionally paste may interfere with, possibly one out of the six prints coming from the glass freely. A preventative for this trouble can be found in the use of a little castile soap in the last water which the prints are put through. Take a piece of pure castile soap and swish it through the water a few times until the water feels smooth to the touch. Prints going from this water on to the squeegee glass will be sure to come off free.

BECKER'S SEPIA FORMULA FOR COLLODIO-CARBON.

Printing.—Print about two shades lighter than desired for regular black and white toning, or until the high-lights are slightly tinted.

Washing.—Wash in four changes of clear water. In the fifth water add a handful of salt to say about two gallons of water. Allow the prints to remain in this water for from five to ten minutes, or until they become a decided yellow in the high-lights. Then wash in four changes of clear water, and tone in the following bath, to color desired when finished.

Toning.

Water	128 oz.
Aristo Platinum No. 2 (full strength)	6 drm.

Prints should tone in from one and a half to two minutes' speed. If they tone slower add platinum.

Washing after Toning.—After prints are toned wash in four changes of clear water. In the second water after toning add a few drops of saturated solution of sal-soda. This kills the action of the acid from the platinum bath.

Fixing.—Fix prints in hypo bath, 18 hydrometer test, for twenty minutes. After fixing place the prints in salt water for ten minutes, then wash as usual.

Notes.—1. Pay no attention to bronzing of prints in the shadows, as this will disappear as soon as prints go into the platinum toning bath.

2. The salt used in the wash water before toning prevents the high-lights from bleaching in the toning bath.

3. The platinum bath can be used over again by taking one-half old bath and half fresh water; add enough platinum to bring speed of toning to five or eight minutes.

ARISTO GOLD PAPER.

Directions.

Printing.—Print Aristo Gold Paper about shade of finished print. The character of tone depends on depth of printing. Make a trial of two or three prints, printed to different depths, as a guide for the tone you most desire.

Carbon Sepia Tones.—Wash the prints thoroughly in six changes of water, separating prints in each wash by hand, and fix for 20 minutes in a hypo bath 30 grains strong, hydrometer test, which is equivalent to 4 ozs hypo crystals to 32 ozs. water (4 ozs. hypo crystals, equal to 16 teaspoofuls). After prints are fixed wash in 10 changes of water, separating prints constantly in each water for 5 minutes; after washing they are ready for mounting.

Purple Tones.

Salt Bath.—After printing place the prints, one at a time face down, into a tray containing 16 ounces of water to which has been added ¼ ounce of table salt. In this solution the prints should be kept in motion and thoroughly separated. Allow them to remain in this solution until they turn to a purple tint, after which rinse off in a tray of clear water containing a little sal-soda. Just enough sal-soda should be added to this water to make it feel smooth to the touch. Leave prints in this soda water two or three minutes, then remove them to

Fixing Bath, which should be made as follows:

Water	8 oz.
Hyposulphite of soda (crystals)	1 oz.

Allow the prints to remain in this bath 15 minutes, during which time they should be kept thoroughly separated by handling them over one by one.

Washing.—After the fixing, wash prints through 10 changes of water, by hand, when they are ready to mount.

If prints are to be used unmounted, blot them off carefully, and place them between clean, dry blotters to dry. If kept flat until thoroughly dry they will always remain so.

GIRL IN WHITE
Mrs. J. E. Bennett

ARISTO GOLD POST CARD.

Directions.—Print until all detail is out or about the shade of the finished print.

Wash in six changes of water, separating the cards thoroughly in each water.

Fix for 20 minutes in hypo bath 30 grains strong, hydrometer test (or 4 ounces hypo crystals to 32 ounces water.)

Wash one hour in running water or sixteen changes, by hand, separating the cards thoroughly in each water.

Dry between photographic blotters.

To flatten cards, proceed as follows: Take a piece of two-inch gas pipe two feet long and cover it with clean paper, pasting the paper to the pipe. Cut a strip of heavy, strong paper several yards long and two feet wide, roll same around pipe, after a couple of turns roll the cards in, face down, between paper and pipe; continue to roll until all cards are in, and let them stand for one hour. Should cards curl too much, reverse and put in roll for five or ten minutes.

ARISTO, JR.

Directions.

Printing.—Print considerably darker than desired when finished. Good bold prints are made under two or three thicknesses of tissue, especially in case of weak negatives.

First Washings.—In summer use water as runs from the tap, natural temperature. In winter use only enough warm water to give comfort to the hands.

It is important to wash free silver and preserving chemicals from paper before toning, but do so by rocking tray through five or six changes of water. Do not handle prints over; it is not necessary, and increases the chances of red spots or stains.

Toning.—Tone in the following bath: Water 60 ounces, No. 2 Aristo Gold 1 dram, or, if dry chloride of gold is used, 2 grains and ½ dram of dry acetate of soda. Add a few drops of saturated solution of borax, enough to make the bath slightly alkaline. Allow to stand two or three hourse before using.

For Dark Tones.—This bath can be renewed two or three times by the addition of gold:

Water	32 oz.
Sulpho cyanide of ammonia	½ oz.
No. 2 Aristo gold	1 drm.

NOTE.—If Aristo Gold is not available, use 3 grains of ordinary gold.

Fixing.—Fix in hypo bath 10 to 12 hydrometer test, or 1 ounce saturated solution hypo to every 16 or 18 ounces of water. Have plenty of bath to cover prints nicely, and separate thoroughly; 15 or 20 minutes will be sufficient time.

Final Washing.—Final wash thoroughly. It is the frequent and complete change of water that washes the hypo from a print, not continuous soaking. One hour in running water that changes completely every few minutes is sufficient, or seven or eight changes of water if prints are washed by hand.

ARISTO SELF-TONING PAPER.

Directions.

Printing. — Print a very little darker than desired in finished print.

Salt Bath.—After printing place prints, one at a time face down, into a tray containing 16 ounces of water to which has been added ¼ ounce of table salt. In this solution the prints should be kept in motion and thoroughly separated. Allow them to remain in this solution until they turn to a purple tint, after which rinse off in a tray of clear water containing a little sal-soda. Just enough sal-soda should be added to this water to make it feel smooth to the touch. Leave prints in this soda water two or three minutes, then remove them to the

Fixing Bath, which should be made as follows:

Water	8 oz.
Hyposulphite of soda (crystals)	1 oz.

Allow the prints to remain in this bath 15 minutes, during which time they should be kept thoroughly separated by handling them over one by one.

Note. — Print Matt Self-Toning about shade of finished print.

Washing.— After the fixing, wash prints through 10 changes of water, by hand, when they are ready to mount.

MONARCH MATTE.

Printing.— Being rich in silver it requires printing only to the point where the highest lights are slightly tinted; in other words, continue while the print is gaining in strength and brilliancy, and stop when print begins to lose. If you over-print the high-lights they will not clear up and you will get muddy half-tones. Remember this paper does not bleach and you do not allow for it.

Washing. — Wash prints in five or six changes of water, handling prints over each time. Wash until all traces of free silver have disappeared. To prevent red spots, caused invariably by grease or oil in the water, make first wash water slightly alkaline (one ounce saturated solution carbonate soda to each gallon water used.) After handling prints over in this, wash in four or five changes of water. Where rain or soft water is used, the addition of the carbonate soda is unnnecessary. Having the wash water at a temperature of from 65 to 70 degrees is productive of best results.

Gold Toning Bath.—For the best results, the gold toning bath should be made up fresh each time, and about two hours before toning, as follows:

Water	60 oz.
Monarch gold solution	1½ drm.
Salt	¼ teaspoonful

This bath should be made very slightly alkaline with borax for olive tones, with carbonate soda for warm black tones, with bicarbonate soda for purple-black tones. We recommend carbonate soda, same giving clearest shadows. Test your gold bath with red litmus, adding only enough of the alkali to turn the litmus a purple tint, *not enough to turn it a decided blue,* ten to fifteen drops of the alkali usually being sufficient. Too much alkali results in yellow whites and muddy shadows. Speed of gold bath should be from six to eight minutes, not faster. Tone to a medium purple.

Intermediate Washing.—After gold bath wash prints in three or four changes of water, handling prints over each time. Under no consideration wash prints here in running water.

Platinum Toning Bath.—The platinum toning bath should also be made up fresh for each toning, and, too, at least from one and one-half to two hours before toning, as follows:

Water	20 oz.
Monarch platinum solution	1½ drm.

This bath should tone in six minutes, slow toning in the platinum bath destroying the brilliancy of the prints. For rich black tones, tone prints in this bath just until the red disappears from the shadows by transmitted light. This bath should be kept at a temperature of 70 degrees, in cold weather 75 degrees.

Monarch Matte has more latitude in the platinum bath than any other collodion paper, and the tendency is to over-tone in this bath, thereby getting olive or brown tones instead of blacks.

N. B.—To those desiring to dissolve their own chloro platinite, we recommend their using E-A Platinite. Formula for use of same is furnished on application.

Intermediate Washing.—After platinum toning bath, prints should be washed in three or four changes of water, prints handled over each time. Where large batches of prints are toned, a check bath is recommended as follows: From platinum bath place prints into water made slightly alkaline with carbonate soda (one-half ounce saturated solution carbonate soda to the gallon of water.) After this wash the prints in three changes of water.

Hypo Bath.—The hypo bath should be 15 degrees hydrometer test, and prints fixed in same for fifteen minutes. For thorough fixing we advise the handling of the prints while in the hypo, (1½ ounces hypo to 30 ounces water.)

Final Washing.—If this is done by running water, one to one and one-half hours is sufficient, frequent handling of the prints however necessary. If washing is done in trays and by hand, at least fifteen changes of water are essential.

Sepia Tones.—Monarch Matte produces the most perfect sepia tones when handled as follows:

Printing. — Print only a shade deeper than the sepia tone desired, making no allowance for bleaching.

Washing. — Wash prints and handle through first wash water; to second wash water add four ounces of salt to each gallon of water, handle prints over in this salt bath for five minutes, after which wash through three changes of water and tone as follows:

Water	50 oz.
Monarch gold solution	1 drm.
Salt	½ teaspoonful

and to which add ten drops saturated solution carbonate soda. Tone print so as to just clear the whites, taking prints directly from gold bath into

Intermediate Wash.—As follows: To every gallon of water used add six ounces of salt. From this place prints directly into hypo bath made as per the following:

Hypo Bath.—The hypo bath to be 12 degrees hydrometer test, and to each gallon of hypo bath add two ounces of salt. Fix prints in this bath from twelve to fifteen minutes.

Final Washing.—This to be as usual and according to instructions heretofore mentioned. N. B.—Do not be alarmed at the color of the prints in the hypo bath, they will dry down to a perfect sepia.

Important.—Too much care cannot be exercised in the use of proper chemicals and their purity. We therefore recommend the use of "E. A." Chemicals, E. A. Platinite and Monarch Solutions. These are at all times pure and of uniform strength.

MONARCH GLACÉ.

Print a shade darker than print is desired, only slightly tinting the high lights. Change prints in subdued light. Wash thoroughly in slightly warm water, through five or six changes, or until the wash water shows no trace of silver.

Make Gold Toning Bath as follows:

Water	60 oz.
Monarch gold	1 dr.

Make slightly alkaline (Litmus test) with bicarbonate of soda for warm or purple tones.

With borax for brown tones;
With carbonate of soda for cherry tones.

Wash through two or three changes of water. Fix prints in a hypo bath of 8 hydrometer test for from 12 to 15 minutes. Wash prints after fixing in running water at least *one hour*, *or half an hour if washed by hand.*

ACTINO MAT.

The printing should be carried deep enough to tint the whites. Pay no attention to the shadows. The preliminary washing must be very thorough, generally requiring from seven to ten changes.

The gold bath should be made up several hours before using. Use 1 grain of gold to 32 ounces of water, and add enough of a saturated solution of borax to turn red litmus paper blue in about three or four minutes. *Bath must be very slightly alkaline.* Prints should tone in the gold in about eight minutes.

Wash prints in several changes of water between the gold and platinum baths. *This is important.*

The platinum bath should be made up several hours before use, and should not be too cold. Use three to four drams of Columbian Platinum Solution to 32 ounces of water. Prints should tone in about the same time as required in the gold; not less than five minutes. Slow toning in the platinum give the best results.

Wash in two or three changes of water before fixing. Fix ten minutes in plain hypo bath of 18 hydrometer test.

ROYAL PAPER.

The printing should be carried a few shades darker than the finished print is desired. Wash the prints in not less than six changes of clear water.

Toning. Stock Gold Solution.

Water	15 oz.
Chloride of Gold	15 gr.

To make up the toning bath, use one ounce of the gold solution to about thirty-six ounces of pure water. Test the solution with blue litmus paper for acidity and slowly add enough of a saturated solution of borax or bi-carbonate of soda (baking soda) until the bath turns the litmus paper blue. This should take about three minutes. Particular attention should be given to keeping the bath very slightly alkaline while in use; too much alkaline will give bluish tones in the whites and highlights, while insufficient alkali will cause the whites to assume a pink or old gold appearance. The prints should tone in about eight or ten minutes to secure the best results. If the bath tones slower, add more of the gold solution, and if too rapidly, more water should be added. For warm tones, tone the prints until the highlights are clear and the shadows are a cherry red. For purple or darker tones the operation should be carried somewhat further.

As soon as a print is toned transfer to clear water, and when the operation is finished give them one or two changes of clear water before fixing.

Fixing.—We recommend making up the hypo bath by hydrometer test, which should be about 18 degrees. By weight use one ounce of crystal hypo to 14 ounces of water. The prints should be fixed for about ten minutes. To prevent the softening of the film and blistering, especially during warm weather, the following hardener may be used:

Hardener.

Hot Water	64 oz.
Borax	6 oz.
Sulphate of Soda	8 oz.
Powdered Alum	16 oz.

Use 1 ounce of this solution to 16 ounces of fixing bath. During very warm weather the Hardener may be added to the first preliminary washing in about the same proportion.

After fixing, the prints should be washed very thoroughly.

Mount wet in the usual manner, burnish with hot burnisher, using hard castile soap for a lubricator.

EASTMAN'S PERMANENT BROMIDE PAPERS.

Directions.

We recommend Amidol or Metol Hydro developer for use with all our Bromide Papers, and publish herewith the formulæ we have found most desirable.

Amidol Developer.

Concentrated Solution.—The concentrated stock-solution is prepared by dissolving in succession in

12 ozs.	Water.
1½ "	Sulphite Soda, des.
½ "	Amidol.

Enough of this stock solution should be prepared at one time for only one day's use.

To Develop.—Take in a suitable tray:

Concentrated Stock-Solution	1½	ozs.
10 per cent. Solution, Bromide of Potassium	8	drops.
Water	6	ozs.

Use developer at a temperature of about 70°Fahr. After exposure, soak the paper in water until limp and brush lightly over the surface, while wet, with a tuft of cotton and flow developer over the print.

The image should appear slowly and should develop up strong, clear, and brilliant. When the shadows are sufficiently black, pour off the developer and rinse the print thoroughly with pure water. Increasing the amounts of Bromide Potassium given in our formulæ is sometimes necessary to prevent grayish highlights.

Immerse print for 10 minutes in the

Fixing Bath.

Hypo-sulphite Soda,	3 ounces.	Water,	16 ounces.

After fixing, wash thoroughly for two hours and hang up to dry.

A fresh fixing bath should fix twenty-four 8x10 prints or equivalent.

SEPIA TONES ON EASTMAN'S BROMIDE PAPERS.

We publish herewith two methods for securing sepia tones on Bromide paper. We believe that the use of Royal Re-Developer will, in time, supplant the cold hypo toning bath which, for a number of years, we have recommended.

Results secured with Royal Re-Developer, are chemically identical with those obtained by the Hypo-Alum method; there can be no question of permanency, and there is no change from the original black and white in either detail or gradation. Re-developed Royal Bromide prints are particularly pleasing, but a Bromide print of any texture or surface which has been fully fixed and thoroughly washed, will give a desirable result when redeveloped. The expense of the process is slight, as three hundred 8x10 prints, or equivalent, can be redeveloped with the contents of a 75-cent package of Royal Re-developer and the time involved is not long as a print can be turned sepia in less than two minutes.

COLD HYPO TONING BATH.

Directions. — By using the following formula rich brown and sepia tones can be easily obtained.

Formula.

Hypo-sulphite of Soda	20 oz.
Ground Alum	4 oz.
Hot Water (almost boiling)	2 gal.

Dissolve the Hypo in the water first, then add the alum slowly; when all are dissolved the solution should be milk white. Allow it to settle several hours, then decant the clear solution and use cold.

To Tone.—After prints are developed and fixed, wash in three or four changes of water and then immerse in the cold toning bath, being careful to remove all air bells. Immerse prints face down, sliding in one edge first to avoid air bells. In putting several prints in bath, slide them one by one underneath the first prints immersed. The print or prints should be handled over occasionally during the first four or five hours and may then be left in the bath over night or until the desired tone is acquired.

After toning wash thoroughly and hang up to dry.

Details.

Prints must be thoroughly fixed before toning.

Prints should be toned face down.

Solution may be used repeatedly by adding fresh bath occasionally.

A number of prints can be toned in one bath at the same time.

Spots of unevenness in the tone will disappear if print is left in the bath and occasionally moved.

The toning takes from 15 to 20 hours.

If tone of prints is yellow instead of sepia, it is caused by water not being sufficiently hot when bath is made.

MONOX BROMIDE PAPER

Amidol Developer.

	Avoirdupois.	Metric.
Amidol	60 gr.	4 grm.
Sulphite soda crystals	1 oz. or hydrometer test 14 or one-half the amount of dry powder.	30 grm.
Water	24 oz	750 grm.

To every 8 oz. Ready Developer add 10 minims of a 10 per cent. solution of bromide of potash. For very strong negatives the bromide of potassium should be omitted, and the developer weakened by increasing the amount of water. For soft, weak negatives the quantity of bromide of potassium may be doubled.

Metol Quinol Developer.

Water	30 oz.
Sodium sulphite crystals,	1½ oz. or one-half the amount of dry powder.
Metol	20 gr.
Hydroquinol	90 gr.
Sodium carbonate crystals	2½ oz. or one-half the amount of dry powder.

When mixed, add 1 drachm of 10 per cent. solution of bromide of potassium.

P. M. C. BROMIDE PAPER.

Developer:

	Avoirdupois.	Metric.
Amidol	60 gr.	4 grm.
Sulphite soda, gran.	1 oz.; or hydrome'r test, 14	30 grm.
Water	32 oz	1000 grm.

CYKO PAPER.

Cyko, being a developing-out paper, may be printed in a few seconds by any light.

The Welsbach gaslight will probably afford the most satisfaction, owing to its high illuminating power and steadiness. Daylight may be used, but as it varies constantly, artificial light is preferable.

Formula for Developer.

Formula No. 1.

Water, soft or distilled	32 oz.
Metol	15 gr.
Sodium sulphite (dried, powdered)	1 oz.
Hydroquinone	60 gr.
Sodium carbonate (granular)	¾ oz.
Potassium bromide	3 gr.

Dissolve the chemicals in the order named, and remember that, while the above amount of bromide is usually sufficient, it may at times be found that more of the bromide solution must be added in order to produce clear whites, owing to the chemical composition of the water used.

These chemicals will dissolve in cold water, but much more readily in warm water; if warm water be used, the solution should be allowed to cool before using, about 70° F. being the proper temperature.

The above developer is suited for the contrast grades of Cyko; for normal Cykos it should be diluted with an equal quantity of water, and for soft Cykos more water than for the normal may be desirable. It is also excellent for negatives if diluted with two parts of water.

Professional photographers using developer in large quantity will find the following formula well suited to their use, especially when manipulating studio Cyko.

Formula No. 2, for Stock Developer.

Warm water (soft or distilled) 1 gallon	128 ozs.
Metol	½ oz.
Sodium sulphite (dried, powdered)	16 ozs.
Hydroquinone	2 ozs.
Sodium carbonate (granular)	12 ozs.
Potassium bromide (crystals)	1 dram.

Mix in order named. Keep in well-stoppered bottles.

For Contrast Cykos.*

Stock developer	1 oz.
Water	3 oz.

For Normal Cykos.*

Stock developer	1 oz.
Water	5 oz.

For Soft Cykos.*

Stock developer	1 oz.
Water	6 oz.

* Note.—The addition of a few drops of bromide of potassium (10 per cent. solution) may be necessary to clear the whites.

For those preferring to use other developers, the following formulæ are given:

Formula No. 3, Amidol.—Stock Solution:

Amidol	80 gr.
Sodium sulphite (dried, powdered)	½ oz.
Water	10 oz.

For use, take stock 1 ounce, water 3 ounces, bromide 5 drops 10 per cent. solution.

This is a simple and economical developer, giving blue-black tones, but oxidizes sooner than metol.

Formula No. 4, Edinol:

Edinol	15 gr.
Acetone sulphite	75 gr.
Sodium carbonate (dry)	113 gr.
Water	3⅓ oz.

1 drop 10 per cent. solution bromide of potassium.

Edinol and Amidol are free from the irritating influence on very absorptive skin sometimes caused by metol.

Fixing Bath.

Hypo	12 oz.
Water	64 oz.

Dissolve, and then add

Water	5 oz.
Sodium sulphite (powdered)	½ oz.
Acetic acid, No. 8	3 oz.
Alum (powdered)	½ oz.

VELOX FORMULAE.

Dissolve chemicals one at a time in the order named in amount of water stirring constantly.

200 ozs. hot water (temperature not higher than 150° Fahr.)

1 oz. Metol.
4 ozs. Hydroquinone.
15 ozs. Sulphite Soda dessiccated or 30 ozs. crystals.
25 ozs. Carbonate Soda desiccated or 50 ozs. crystals.
½ oz. Bromide Potassium crystals.

This concentrated developer will keep for several weeks in a demijohn and indefinitely in full bottles well stoppered. This formula as will be seen, will make 600 ounces of Developer for Regular papers and 1000 ounces for Special papers. A bath made one part stock solution to two parts water can be used to develop both Regular and Special Velox. Substitution of Ortol, quantity for quantity for Metol in the above formula, will be desirable if there is any objection to the latter developing agent.

For Regular Velox papers, use one part stock solution to two parts water. For special Velox papers, use one part stock solution to four parts water.

Keep the temperature of solution about 70° Fahr.

After the stock solution has been standing several days a slight precipitation may be noticed; this, however, will do no harm and perfect prints can be obtained from the bath as it is. When the dilution of the stock solution is made as directed above, the precipitated Chemicals will be redissolved.

The time of Development of Regular papers should not exceed fifteen seconds, while that of the Special should be about twenty seconds if developed in the same bath as for Regular or not to exceed thirty seconds if in a bath of half strength.

Full control of contrast is secured by varying the dilution of developer, remembering that when using *any* Velox paper, "the stronger the developer the softer the print will be." The softest possible print will be produced by developing with undiluted stock solution. Place prints directly in developer, never immersing in water previously. We advise that immediately after removing prints from the developer they be dipped in water for a second before placing in an Acid Fixing Bath made as follows:

Prepare as many ounces of Hyposulphite Soda solution (made up one part hypo to four of water or 70° hydrometer test) as are needed for the size of tray or number of prints to be fixed. (The more solution the better for obtaining clean prints properly fixed.)

To 10 parts of thes hypo solution add one part of the Hardening solution given herewith:

20 ozs.	Water.
2 ozs.	Sulphite Soda desiccated or 4 ounces crystals.
12 ozs.	Acetic Acid No. 8 (containing 25 per cent. pure acid).
4 ozs.	Powdered Alum.

Let prints be in the fixing bath about 15 minutes.

Velox prints should be washed for an hour in running water or ten changes of water and afterward dried face down on cheesecloth stretchers. Prints will curl very slightly if treated in this manner.

Abrasion marks frequently appear on Regular and Special Glossy Velox but can be avoided by the use of Velox Liquid Developer *Non-Abrasion.* The Metol-Hydro Developer mentioned in this circular, can be rendered "Non-Abrasion" by the addition of Iodide of Potassium crystals in the proportion of 10 grains Iodide to each fluid ounce of stock solution.

DEKKO PAPER.

Developers.

Metol-Hydrochinon.

Metol	7½ gr
Hydrochinon	30 gr.
Sulphite of soda (crystals)	218 gr.
Carbonate of sodium (crystals)	163 gr.
Water	12 oz.

Dissolve and add about 25 drops of a solution composed of bromide of potassium ½ oz., water 5 oz. This solution is to be used without diluting.

Amidol.

Amidol	80 gr.
Sulphite of soda (crystals)	200 gr.
Water	10 oz.

For use, take 1½ oz. of above stock solution, 3 oz. of water, and add 3 to 5 drops of bromide of potassium solution made of bromide of potassium ½ oz., water 5 oz.

ARGO.

To Develop: After exposing, immerse print in developing solution made as per formula.

Metol Quinol Developer.

Water	10 oz.
Metol	7 gr.
Sodium sulphite (dry powder)	120 gr.
or crystals double the quantity.	
Hydroquinone	30 gr.
Sodium carbonate (dry powder)	200 gr.
or crystals double the quantity.	

When mixed, add to the above 15 to 25 drops of a bromide potassium solution composed of

Bromide of potassium	1 oz.
Water	10 oz.

Amidol Developer.

Amidol	20 gr.
Sulphite soda (crystals)	160 gr.
or dry, in the form of powder, half the amount.	
Water	8 oz.

When mixed, add to above 5 to 10 drops of bromide of potassium solution composed of

Bromide of potassium	1 oz.
Water	10 oz.

ROTOGRAPH.

Developer for Rotograph and Rotox Paper.

Water	150 oz.
Sulphite of soda	6 oz.
Metol	150 gr.
Hydro	½ oz.
Carbonate of soda	4 oz.
Bromide of potassium	20 gr.

The following is a good sepia formula—make the following stock solutions :

A.

Water	12 oz.
Ferri cyanide of potassium	1 oz.

B.

Water	12 oz.
Bromide of potassium	1 oz.

(Keep out of strong light.)

C.

Water	12 oz.
Sulphide of sodium	½ oz.

Take 1 ounce of solution A, 1 ounce of solution B, and 4 ounces of water. Place this in a dish and add 3 drops of pure water ammonia. In another dish put 1 ounce of solution C and 3 ounces of water. Place a tuft of cotton in each dish.

Moisten the black print which is to be made sepia, and place it face upwards on a glass, and go over the print with cotton dipped in the first solution until the print is entirely bleached out as far as possible, in other words until it has almost disappeared. The print must now be washed at least one minute in running water.

Next go over the print rapidly with cotton which has been dipped in second solution until there is an even sepia tone over entire print. Wash print in running water at least thirty minutes. Permanency can only be obtained by this thorough washing. Be sure that sulphide of sodium is used and not sulphite.

Formula for Cleaning Whites in Bromide Paper.

Iodine	60 gr.
Potassium cyanide	60 gr.
Iodide	120 gr.
Water	10 oz.

Take three or four drops of stock solution, add to two ounces of water, swab with cotton the whites or whole print.

AZO PAPER.

Metol Hydrochinon Formula.

Metol	5 gr.
Hydrochinon	20 gr.
Sulphite of soda	145 gr.
Carbonate of sodium	108 gr.
Water	8 oz.

Dissolve and add about 16 drops of a solution composed of bromide of potassium ½ oz., water 5 oz. This solution is to be used without diluting.

Amidol Formula.

Amidol	64 gr.
Sulphite of soda (crystals)	160 gr.
Water	8 oz.

For use, take 1½ oz. of above stock solution, 3 oz. of water, and add 2 to 4 drops of bromide of potassium solution made of bromide of potassium ½ oz. water 5 oz.

LUMIÈRE CITRATE P. O. P.

Exposure.— Prints losing depth by toning, printing must be carried further than necessary for intensity desired. Examination of the prints should be made by diffused daylight or lamplight only. Do not expose printing frame out of a window when raining, damp being liable to cause the paper to adhere to the negative and injure it.

The value of a negative has a considerable influence on that of the print. Prints tone better and give the most fresh and clear tints when negative is correctly timed and sharp without too much contrasts.

Toning.— First wash prints a few minutes in running water.

In hot weather this washing must be preceded by one minute's immersion in a 3 per cent. alum solution, or, better still, in a 1 per cent. solution of Lumière's Formolene.

Any of the ordinary toning and fixing baths may be used with Lumière's Citrate P. O. P. The following combined toning and fixing formula give the best results as to vigor, brilliancy and permanency:

A.

Boiling water ....to	1000	grms. or parts	30 oz.
Hyposulphite of soda	250	" "	8 oz.
Alum	15	" "	½ oz.
Lead acetate	2	" "	30 gr.

First dissolve hyposulphite of soda and alum in boiling water, filter, and after cooling add lead acetate previously dissolved in a little distilled water.

B.

Distilled water	100	grms. or parts	3 oz.
Chloride of gold...........	1	" "	15 gr.

For use take

A—100 c. c.	3 oz.
B— 6 c. c.	80. min.

This bath is prepared 24 hours before use. To clear same, add a small quantity of kaolin, shake and filter. It is recommended to expose this bath to daylight some hours before use.

Any modification in this formula is liable to injure the print.

The preparation of this bath being somewhat delicate, a solution of Lumière's Combined Toning and Fixing Powder may be advantageously substituted.

For those who prefer the separate baths we give the following formula:

Distilled water ....to	1000	grms. or parts	30 oz.
Refined chalk	80	" "	2½ oz.
1 per cent. sol. bold chloride	100	c. c. "	3 oz.

It is essential to prepare this bath but a few days beforehand, its strength decreasing gradually.

Allow to stand for 24 hours, then filter and use as a stock solution 15 parts of solution for 100 parts of water, or 1 ounce of solution for 7 ounce of water.

Before toning, prints should be washed as directed above, then immerse one by one in the toning bath.

When toned wash rapidly and transfer in the following:

Water ....to	1000	grms. or parts	32 oz.
Hyposulphite soda	200	" "	7 oz.
Alum	3	" "	45 gr.
1 per cent. sol. of lead acetate	15	c. c. "	¼ oz.

The alum may be substituted by 10 grammes or 150 grains of Lumière's Formolene.

First dissolve hyposulphite of soda and alum in boiling water, filter and, after cooling, add lead acetate previously dissolved in a little distilled water.

Renew this solution frequently.

Caution.—In order to avoid stains immerse prints one by one in the bath; remove air bubbles with a tuft of cotton wool, gently rock the dish; during toning use a large porcelain dish in preference.

Toning bath must be abundant and at 65 degrees to 70 degree F. Toning is complete in about 10 minutes. Take the prints out as soon as half tones have attained desired value, otherwise they would appear corroded, as is often the case with exhausted baths.

Not more than three 5x7 prints are to be toned in every ounce of fresh solution.

Borax and Gold Toning.—Beautiful violet tones may be obtained by treating Lumière's Citrate P. O. P., previously to combined toning and fixing, with the following borax and gold toning:

Water	1000 c. c.	or parts	40 oz.
Borax	10 grms.	"	½ oz.
1 per cent. sol chloride of gold	25 c. c.	"	1 oz.

Add chloride of gold just at time of use.

Platinum Toning.—A great variety of tones may be obtained with Lumière's Citrate Matt, by using the following bath:

Water	500 grms.	or parts	16 oz.
Sodium chloride	2 "	"	30 gr.
Potassium chloroplatinite	1 c. c.	"	15 gr.

Carry printing much further than desired intensity. Immerse the prints after previous washing in the above bath, in which they remain till black tone is attained, they must then be washed rapidly and fixed in the combined toning and fixing bath.

Tones vary with the length of time the prints are immersed in the platinum bath.

LUMIÈRE BROMIDE PAPERS.

Developer.

Lumière's Diamidophenol (1):

Water	1000 grms.	or parts	32 oz.
Anhydr. sodium sulphite	15 "	"	½ oz.
Diamidophenol	5 "	"	75 gr.
10 p. ct. sol. potassium bromide	2 c. c.	"	30 min.

(2) Anhydrous sodium sulphite may be substituted by twice as much sodium sulphite in crystals.

The relative proportion of sulphite and diamidophenol may be measured in volume by using 1½ parts of sulphite for 1 of diamidophenol.

A stock solution of sulphite may also be advantageously used, but it retains its strength only for a week; beyond that time its strength decreases gradually without any apparent change.

The following formula will be found to give good results:

Water	1000 grms.	or parts	32 oz.
Anhydrous sodium sulphite	14 "	"	½ oz.
10 p. ct. sol. potassium bromide	2 c. c.	"	30 min.

For every ounce of the stock solution add at the time of use 2½ grains of diamidophenol.

This solution is best prepared just before use.

Fixing takes place by five minutes' immersion in the following:

Water	1000 grms. or parts	30 oz.
Hyposulphite of soda	200 " "	6 oz.
Sodium bisulphite	100 " "	3 oz.
Alum	2 " "	30 gr.

or preferably:

Water	1000 grms or parts	30 oz.
Lumière's fixing salt	1 package.	
Lumière's formolene	10 grms. or parts	150 gr.

This bath may be used for a long time.

SOLIO PAPER.

Combined Toning Bath.

Stock Solution A.

Hyposulphite of soda	8 oz.
Alum (crystals)	6 oz.
Sugar (granulated)	2 oz.
Water	80 oz.

Dissolve above in cold water, and, when dissolved, add Borax, 2 oz.; dissolved in hot water, 8 oz.

Let stand over night, and decant clear liquid.

Stock Solution B.

Pure chloride of gold	7½ gr.
Acetate of lead (sugar of lead)	64 gr.
Water	8 oz.

Solution B. should be shaken up before using, and not filtered.

To tone 15 cabinets, take

Stock Solution A	8 oz.
Stock Solution B	1 oz.

Place prints in the above without previous washing.

Tone to desired color, and immerse prints for five minutes in following salt solution to stop the toning:

Salt	1 oz.
Water	32 oz.

The extra fixing bath should be used to ensure *thorough fixing*.

After the salt bath, give one change of cold water, and fix for ten minutes in the

Extra Fixing Bath.

Hyposulphite of soda	1 oz.
Sulphite of soda (crystals)	60 gr.
Borax	¼ oz.
Water	20 oz.

Wash 1 hour in running cold water, or in 16 changes of cold water, when prints may be mounted same as albumen prints.

The combined bath must be used cold, not above 50° Fahr. This condition can be obtained by placing a piece of ice in the bath when toning. If the bath is too warm, it will cause yellow prints with a greenish cast in the half-tones.

ALBUMA PAPER.

Combined Toning and Fixing Bath.

Hot water	66 oz.
Hypo.	16 oz.
Sulpho-cyanide ammonia	2 oz.
Acetate lead	⅓ oz.
Nitrate lead	½ oz.
Citric acid	½ oz.
Chloride of gold (in solution)	4 gr.

Separate Bath Formula.

Print—To good strength same as albumen paper.

Wash in eight or ten changes of water, or until all the free silver is removed.

Toning Bath.

Stock Solution A

Water	15 oz.
Chloride of gold	15 gr.

Stock Solution B

Water	2 oz.
Acetate soda	1 oz.

To tone, take

Water	32 oz.
Stock Solution A	1 oz.
Stock Solution B	⅛ oz.

Keep bath slightly alkali with bi-carbonate of soda. Test with litmus paper.

Mix one hour or more before using. Should tone in ten minutes. If bath tones quicker, add water; if slower, more gold. Best results are obtained by using half old and half new bath.

Transfer to runnning water, or wash in two or three changes of water.

Fix for ten minutes in

Hypo	4 oz.
Water	64 oz.

KRESKO PAPER.

Separate Bath Formula.—Wash in 5 or 6 changes of water, or sufficient to remove the free silver.

Tone in a plain gold bath, using about 1 grain of gold to 48 ounces of water. Neutralize by adding a saturated solution of borax, bi-carbonate of soda or sal soda.

When toned, immerse prints in running water, where they may remain until all are ready for the fixing.

DIRECTIONS FOR WORKING DISCO GLOSS.

Tone prints in the following bath, moving them while toning:

Water	40 oz.
Chloride of gold	1 gr.

Add a sufficient quantity of borax to turn red litmus paper blue. Tone prints to the desired shade and stop, as they will not change in fixing bath.

Fixing bath prepared as follows:

Water	48 oz.
Hypo	8 oz.

About fifteen minutes in this bath is sufficient. Keep prints separated.

This is a hardened paper, and can be toned in warm water in cold weather. Requires no ice, alum or hardening solutions of any kind.

Combined Toning and Fixing Bath.

To Print: The paper should not be printed quite as dark as albumen.

For blue-black tones print darker than for warm brown.

Do not fume or keep paper near ammonia.

In toning place only a few prints in the bath at a time, using bath enough to cover well the prints, place them in face up, and see that the air bells are removed.

Borax Bath. Stock Solution No. 1.

Hot water, 160° F	64 oz.
Hypo	8 oz.
Pulverized alum	4 oz.
Borax pulverized	2 oz.
Salt (com.)	1 oz.

Stock Solution No. 2.

Water	15 oz.
Chloride of gold	15 gr.

Place all the chemicals in a stone crock and pour the hot water on them, and stir until dissolved; let it cool, clear and decant.

Dissolve ½ oz. of acetate of lead in 8 oz. of water, and add 1½ oz. of it to No. 1 after cooling.

The hot water ripens bath faster. When cold water is used, the bath should stand for twenty-four hours or more to ripen.

To Tone: Add 1 oz. No. 2 to each 8 oz. of No. 1 used.

The above will tone about fifty cabinet prints; then discard and make up as at first. Tone prints to desired shade, then place in the following bath from three to five minutes, which will clear them perfectly and insure fixing.

FOR TONING KLORO, SPECIAL AND KELAT PAPERS.

Toning Bath.

Water	60 oz.
Chloride of gold	2 gr.

Neutralize with a saturated solution composed of acetate soda and borax, equal parts. Test with red litmus paper, getting the bath as near neutral as possible.

Prints should tone in from five to ten minutes; too slow toning produces results which lack brilliancy.

If cold tones are desired, the bath should be made sufficiently strong to tone in from three to four minutes.

When prints have reached the desired tone, place them in large tray containing plenty of clear water, and fix twenty minutes in

Fixing Bath:

Water	40 oz.
Hyposulphite of soda	2 oz.

THE WINDING BROOK
G. Edwin Keller

WOMEN KNITTING
Mrs. Eleanor W. Willard

EASTMAN'S PLATINUM PAPER.

Developer.

Oxalate potassium, c. p.	2 oz.
Phosphate potassium, c. p.	1 oz.
Hot water	19 oz.

Allow the developer to cool, and use at a temperature of not less than 65 degrees, nor more than 75 degrees Fahr.

Clearing Solution.

Muriatic acid, c. p.	¼ oz.
Water	15 oz.

"WATER TONE" PLATINUM PAPER.

"Water Tone" Platinum Paper is very easily affected by moisture; it will, therefore, be noticed when printing in warm, damp weather that the print will show quite a tendency to print out black in the deep shadows. This must not be taken into consideration, as the same amount of exposure is necessary as in dry days.

Print by direct light (sunlight preferred) until the shadows are clearly outlined *in a deep canary color.* At this stage the same detail will be observed in the half tones that the finished print will show. For developing, use plain water, heated to 120 degrees (which will be as hot as they can bear).

The development will be practically instantaneous, and care must be taken to avoid air bubbles forming upon the surface of the prints. Place prints, after developing, directly into a clearing bath of muriatic acid, one dram to twelve ounces of water, and let them remain in this bath about ten minutes, when they are ready for the final washing of fifteen minutes in running water, or five changes of about three minutes each. Lay out between blotters to dry and mount by attaching the corners.

BRADLEY PLATINUM PAPER.

Developer.

A. For Black Tones.

Neutral oxalate potassium	8 oz.
Phosphate potassium	1 oz.
Water	30 oz.

B. For Sepia Tones.

Of above mixed solution	8 oz.
Saturated bichloride mercury solution	1 oz.
Citrate soda	5 gr.

If deep red tones are desired add to B:

Nitrate uranium	10 gr.

then filter and use as a developer.

ANGELO PLATINUM PAPER.

Developer. Mr. Di Nunzio's formula for rich, warm, black tones is as follows:

Neutral oxalate of potash	1 lb.
Hot water	100 oz.

When cool, filter before using. In using old developer, always filter before begining to work.

If more of blue-black is desired, it may be obtained by using a developing solution prepared by the makers of the paper, or the following formula may be employed:

Neutral oxalate of potash	14 oz.
Phosphate of soda	2 oz.
Oxalic acid	1 drm.
Water	80 oz.

Very warm black tones may be had by use of warm development, as follows:

Neutral oxalate of potash	1 lb.
Carbonate of Soda	½ oz.
Water	100 oz.

Sepia Prints on Black and White Paper are made by using 1 to 2 oz. of our sepia solution to 16 oz. of

Neutral oxalate of potash	1 lb.
Hot Water	100 oz.

Print as you would for black and white. In making up the bath, after adding the sepia solution, boil for a few minutes, and, when cool enough not to scorch your fingers, proceed with your developing. After developing, treat prints in two changes of muriatic baths (one-half oz. of acid to 60 oz. of water), and wash them as usual.

AMERICAN PLATINUM PAPER.

Developing. The developer is simply neutral postassium oxalate and water; two ounces of neutral potassium oxalate dissolved in ten fluid ounces of water. If tones, more on the blue black, are desired, use the following developer:

Water	10 oz.
Potassium oxalate	1 oz.
Potassium phosphate	½ oz.

In preparing developer containing potassium phosphate, always use warm water, as this chemical does not dissolve freely in cold water. Any amount of the developer may be made up and set aside for future use, but should be kept in a well-stoppered bottle. Use sufficient developer to cover the bottom of the tray at least one-half inch deep. Develop prints face up. By sliding prints under developer, face up, air-bells are avoided, and the development may be closely watched from the start.

Clearing Bath. As soon as prints are fully developed, they are placed, face down, directly into a clearing bath of muriatic acid and water—one ounce of muriatic acid C. P., to 60 oz. of water. The quality of acid used is of much importance. It should be chemically pure, as ordinary commercial acid will cause yellow prints. Prints should have from three to four changes of acid clearing bath, allowing them to remain in each bath eight to ten minutes, and keeping them separated. The last acid bath should be as clear as pure water, showing no yellow tint.

W. & C. PLATINOTYPE.

Development.—The whole contents of the box of the W. & C. developing salts must be dissolved at one time, as the salts are mixed; and if this is not done, too large a proportion of one of the ingredients may be used.

Development should be conducted in a feeble white light, similar to that used when cutting up the paper, or by gas light.

It may take place immediately after the print is exposed, or at the end of the day's printing.

Develop by floating the print, exposed side downwards, on the developing solution.

Development may take 30 seconds or more.

During the hot summer days it is not advisably to delay unduly the development of exposed prints. If possible develop within one hour after printing.

Either porcelain or agate—preferably porcelain—dishes are necessary to hold the developing solution.

To clear the developed prints: these must be washed in a series of baths (not less than three) of a weak solution of muriatic acid C. P. This solution is made by mixing one part of acid in 60 parts of water.

As soon as the print has been removed from the developing dish it must be *immersed face downwards* in the first bath of this acid, contained in a porcelain dish, in which it should remain about five minutes; meanwhile, other prints follow until all are developed. The prints must then be removed to a second acid-bath for about ten minutes; afterwards to the third bath for about fifteen minutes. While the prints remain in these acid-baths they should be moved so that the solution has free access to their surfaces, but care should be taken not to abrade them by undue friction.

Pure muriatic acid *must be used.*

If commercial muriatic acid is used, the prints will be discolored and turn yellow.

For each batch of prints fresh acid-baths must be used.

After the prints have passed through the acid-baths, they should be well washed in three changes of water during about a half hour. It is advisable to add a pinch of washing soda to the second washing water to neutralize any acid remaining in the print. Do not use water that contains iron, as it tends to turn paper yellow. Soft water is the best for this purpose.

W. & C. SEPIA PAPER.

With a few exceptions the method of carrying out the operations is the same as for the "black" kinds of platinotype paper. The *following points* should be attended to:

The "Sepia" paper is more easily affected by faint light, and, therefore, increased care must be taken when printing.

To develop, add to each ounce of the developing solution 1½ drachms of sepia solution supplied for this purpose, and proceed as described for black paper.

The solution must be heated to a temperature of 150 to 160 deg. Fahr., to obtain the greatest amount of brilliance and the warmest color, but very good results can be obtained by using a cooler developer.

BLUE-PRINT FORMULAE.

No. 1.

Citrate of iron and ammonia	1⅞ oz.
Water	8 oz.

No. 2.

Ferricyanide of potassium	1¼ oz.
Water	8 oz.

Mix equal parts of No. 1 and No. 2, and apply with brush or by floating for three minutes. Plain Rives paper should be used; hang up to dry in darkened room.

Black Lines upon a White Ground.

Gelatine	8 dr.
Perchloride of iron solution (U. S. P.)	6 dr.
Tartaric acid	3 dr.
Ferric sulphate	3 dr.
Water	9 oz.

Filter off any precipitate that may be found, and coat any good, stout, white paper with the full-strength solution. Expose in sunlight till details or lines are visible, and develop with

Gallic acid	6 dr.
Alcohol	6½ oz.
Water	32 oz.

Wash well in several changes of water.

The sensitizing solution is as follows:

Gum arabic	15 gr.
Tartaric acid	2 gr.
Chloride of sodium (common salt)	9 gr.
Sulphate of iron	10 gr.
Iron perchloride	15 gr.
Water	110 c. c.

In mixing the solution, the gum arabic is first dissolved in the water by the aid of heat, and the other salts are added while the solution is still warm. The solution is spread over the surface of the paper with a sponge, and, after allowing a little time for it to penetrate the surface, all superfluous moisture is removed, using the sponge again, well wrung out.

Development is by a plain aqueous solution of gallic acid. After development the print is rapidly washed, when superfluous moisture is carefully sponged off the surface.

TO REMOVE STAINS FROM THE HANDS.

Development Stains.—Yield easily to the action of lemon juice.

Nitrate of Silver Stains.—Prepare a solution of water 100 cc.; chloride of lime, 25 grms.; sulphate of soda, 50 grms. Apply with a tooth-brush.

Pyro Stains.—Wash stained parts with a 10 per cent. solution of oxalic acid.

Amidol Stains.—Difficult to remove. Try citric acid.

Nitric Acid Stains.—Apply to stained parts a solution of permanganate of potash. Then wash freely.

ENLARGEMENTS.

From the British Journal of Photography Almanac.

Focus of Lens.	Times of Enlargement and Reduction.							
Inches.	**1** Inch.	**2** Inches.	**3** Inches.	**4** Inches.	**5** Inches.	**6** Inches.	**7** Inches.	**8** Inches.
2	4 4	6 3	8 $2\frac{2}{3}$	10 $2\frac{1}{2}$	12 $2\frac{2}{5}$	14 $2\frac{1}{3}$	16 $2\frac{2}{7}$	18 $2\frac{1}{4}$
$2\frac{1}{2}$	5 5	$7\frac{1}{2}$ $3\frac{3}{4}$	10 $3\frac{1}{3}$	$12\frac{1}{2}$ $3\frac{1}{8}$	15 3	$17\frac{1}{2}$ $2\frac{9}{10}$	20 $2\frac{6}{7}$	$22\frac{1}{2}$ $2\frac{3}{16}$
3	6 6	9 $4\frac{1}{2}$	12 4	15 $3\frac{3}{4}$	18 $3\frac{3}{5}$	21 $3\frac{1}{2}$	24 $3\frac{3}{7}$	27 $3\frac{3}{8}$
$3\frac{1}{2}$	7 7	$10\frac{1}{2}$ $5\frac{1}{4}$	14 $4\frac{2}{3}$	$17\frac{1}{2}$ $4\frac{3}{4}$	21 $4\frac{1}{5}$	$24\frac{1}{2}$ $4\frac{1}{12}$	28 4	$31\frac{1}{2}$ $3\frac{9}{10}$
4	8 8	12 6	16 $5\frac{1}{3}$	20 5	24 $4\frac{4}{5}$	28 $4\frac{2}{3}$	32 $4\frac{4}{7}$	36 $4\frac{1}{2}$
$4\frac{1}{2}$	9 9	$13\frac{1}{2}$ $6\frac{3}{4}$	18 6	$22\frac{1}{2}$ $5\frac{3}{5}$	27 $5\frac{2}{5}$	$31\frac{1}{2}$ $5\frac{1}{4}$	36 $5\frac{1}{7}$	$40\frac{1}{2}$ $5\frac{1}{16}$
5	10 10	15 $7\frac{1}{2}$	20 $6\frac{2}{3}$	25 $6\frac{1}{4}$	30 6	35 $5\frac{5}{6}$	40 $5\frac{5}{7}$	45 $5\frac{5}{8}$
$5\frac{1}{2}$	11 11	$16\frac{1}{2}$ $8\frac{1}{4}$	22 $7\frac{1}{3}$	$27\frac{1}{2}$ $6\frac{4}{5}$	33 $6\frac{1}{2}$	$38\frac{1}{2}$ $6\frac{5}{12}$	44 $6\frac{2}{7}$	$49\frac{1}{2}$ $6\frac{3}{16}$
6	12 12	18 9	24 8	30 $7\frac{1}{2}$	36 $7\frac{1}{5}$	42 7	48 $6\frac{6}{7}$	54 $6\frac{3}{4}$
7	14 14	21 $10\frac{1}{2}$	28 $9\frac{1}{3}$	35 $8\frac{3}{4}$	42 $8\frac{2}{5}$	49 $8\frac{1}{6}$	56 8	63 $7\frac{7}{8}$
8	16 16	24 12	32 $10\frac{2}{3}$	40 10	48 $9\frac{3}{5}$	56 $9\frac{1}{3}$	64 $9\frac{1}{7}$	72 9
9	18 18	27 $13\frac{1}{2}$	36 12	45 $11\frac{1}{4}$	54 $10\frac{4}{5}$	63 $10\frac{1}{2}$	72 $10\frac{2}{7}$	81 $10\frac{1}{8}$

The object of this table is to enable any manipulator who is about to enlarge (or reduce) a copy any given number of times to do so without troublesome calculation. It is assumed that the photographer knows exactly what the focus of his lens is, and that he is able to measure accurately from its optical center. The use of the table will be seen from the following illustration: A photographer has a *carte* to enlarge to four times its size, and the lens he intends employing is one of 6 inches equivalent focus. He must therefore look for 4 on the upper horizontal line and for 6 in the first vertical column, and carry his eye to where these two join, which will be at 30-7½. The greater of these is the distance the sensitive plate must be from the center of the lens; and the lesser, the distance of the picture to be copied. To *reduce* a picture any given number of times, the same method must be followed; but in this case the greater number will represent the distance between the lens and the picture to be copied, the latter that between the lens and the sensitive plate This explanation will be sufficient for every case of enlargement or reduction.

If the focus of the lens be 12 inches, as this number is not in the column of focal lengths, look out for 6 in this column and multiply by 2, and so on with any other numbers.

Table of Symbols, Atomic Weight and Solubilities of the Principal Chemicals used in Photography.

Abbreviations.—s., soluble ; v. s., very soluble ; sp. s., sparingly soluble ; n. s., not soluble ; dec., decomposed ; del., deliquescent.

NAME.	SYMBOL.	MOLECULAR WEIGHT.	ONE PART IS SOLUBLE IN COLD WATER	ONE PART IS SOLUBLE IN HOT WATER.	ALCOHOL.
Acid, Acetic	$C_2H_4O_2$	60	in	any pro	portion.
'' Boric or Boracic	H_3BO_3	62	25	3	6
'' Carbolic (see Phenol)	C_6H_6O	94	16.6	3	6
'' Citric	$C_6H_8O_7+H_2O$	210	0.75	0.5	s.
'' Digallic (see Tannin)	$C_{14}H_{10}O_9$	322	0.8	0.5	0.8
'' Gallic	$C_7H_6O_5$	170	100	3	8
'' Hydrobromic	HBr	81	s.	s.	s.
'' Hydroiodic	HI	128	s.	s.	s.
'' Hydrochloric	HCl	36.5	s.	s.	s.
'' Hydrofluoric	HFl	20	s.	s.	s.
'' Hydrocyanic	HCy or CN	27	s.	s.	s.
'' Hydrosulphuric	H_2S	34	s.	s.	s.
'' Muriatic (see Hydrochloric)	....	....	....	....	....
'' Nitric	HNO_3	63	in	all propor	tions.
'' Nitrous	HNO_2	47	ab	sorbed.	....
'' Oxalic	$C_2H_2O_4+2H_2O$	126	8	0.2	s. also in ether
'' Pyrogallic (see Pyrogallol)	$C_6H_6O_3$	126	2	v. s.	also v. s. in ether.
'' Salicylic	$C_7H_6O_3$	138	7.6	9	also v. s. in ether.
'' Sulphuric	H_2SO_4	98	in	any pro	portion.
'' Sulphurous	H_2SO_3	82	ab	sorbed.	....
'' Tannic (see Digallic)	....	....	....	....	....
'' Tartaric	$C_4H_6O_6$	150	0.8	0.5	5
Alcohol, Ethyl	C_2H_6O	46	in	all propor	tions.

Alcohol, Methyl (see Wood Alcohol)	CH_4O	32	in all proportions.		
Alum (see Potassium Aluminium Sulphate)	$Al_2(SO_4)_3K_2SO_4+24H_2O$	948.8	10	8	n. s.
Alum Chrome (see Potassium Chromic Sulph.)	$Cr_2(SO_4)_3K_2SO_4+24H_2O$	998.4	10	dec.	n. s.
Amidol (Diamido Phenol)	$C_6H_8N_2O$	124	very soluble.		
Ammonia, Gaseous	NH_3	17	very soluble.		
Ammonium Bichromate	$(NH_4)_2Cr_2O_7$	252	v. s.	v. s.	
" Bromide	NH_4Br	98	1.29	0.7	31.5
" Cadmium Bromide	$2NH_4Br2CdBr_2+H_2O$	678	0.73		5.3
" " Iodide	$2NH_4ICdI_2+2H_2O$	545	0.58		0.7
" Chloride	NH_4Cl	53.5	3	1	sp s.
" Ferric Oxalate	$Fe_2(C_2O_4)_6(NH_4)_6+8H_2O$	892	2.1	0.29	sp. s.
" Fluoride	NH_4Fl	37	v. s.	v. s.	sp. s.
" Iodide	NH_4I	145	1	0.5	s.
" Nitrate	NH_4NO_3	80	2	1	s.
" Oxalate	$(NH_4)_2C_2O_4$	124	4	2	s.
" Persulphate	$(NH_4)SO_4$				
" Sulpho-Cyanate	NH_4CNS	76	s.	s.	s.
Aurantia (Hexanitro-diphenylamin Ammonia)	$NH_4C_{12}H_4(NO_2)_6N$	456			
Aurin (Trioxy-triphenyl Carbinol)	$C_{19}H_{14}O_3$	290			
Barium Chloride	$BaCl_2+2H_2O$	244	2.18	1.5	sp. s.
" Nitrate	$Ba(NO_3)_2$	261	12.2	2.84	n. s.
" Per-oxide	BaO_2	169	v. s.	n. s.	n. s.
Benzole or Benzine (Trioxy-tryphenyl-Carbinol)	C_6H_6	78	n. s.	n. s.	s.
Borax (see Sodium Biborate)					
Cadmium Bromide	$CdBr_2+4H_2O$	344	1.5	1	sp. s.
" Iodide	CdI_2	366	1.5	1	s.
Calcium Bromide	$CaBr_2$	200	1	.75	s.
" Carbonate (see Chalk)	$CaCO_3$	100	n. s.	n. s.	n. s.
" Chloride	$CaCl_2+6H_2O$	219	.75	.5	10
" Hypochlorite (see Chloride of Lime)	$CaCl_2O_2CaCl_2$(?)	254	sp. s.	sp. s.	dec.
Calomel (see Mercurous Chloride)					
Camphor	$C_{10}H_{16}O$	152	1000		v. s.
Caustic Potash (see Potassium Hydrate)					
" Soda (see Sodium Hydrate)					
Chalk (see Calcium Carbonate)					

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NAME.	SYMBOL.	MOLECULAR WEIGHT.	ONE PART IS SOLUBLE IN COLD WATER	ONE PART IS SOLUBLE IN HOT WATER	ALCOHOL.
Chinoline Blue or Cyanine	$C_{29}H_{35}NaI$	533	sp. s.	sp. s.	s.
" Red	$C_{26}H_{19}NaCl$	389.5			
Chloride of Lime (see Calcium Hypochlorite)					
Chlorine	Cl	35.5	absorbed by 1 to 2.5 vols.		
Chloroform	$CHCl_3$	119.5	sp. s.	sp. s.	v. s.
Chrome Alum (see Alum Chrome)					
Copper Acetate (see Verdigris)	$Cu(C_3H_3O_2)_2 + H_2O$	223.4	14	5	1 in 14
" Bromide	$CuBr_2$	223.4	1	.75	s.
" Chloride	$CuCl_2 + H_2O$	152.4	1	.75	v. s.
" Sulphate (see Blue Vitriol)	$CuSO_4 + 5H_2O$	249.4	3	1	n. s.
" " and Ammonia	$CuSO_4 + 4NH_3 + H_2O$	245.4	s.	v. s.	n. s.
Corrosive Sublimate (see Mercuric Chloride)					
Dextrine	$C_6H_{10}O_5$	162	easily s.		n. s.
Eikonogen (Amido-β-Naphthol-β-Monosulphonate of Sodium)	$C_{10}H_8SO_4NaN$	261	40	e. s.	s.
Eosine, Yellow Shade (Tetra Bromo-fluoresceine Potassium)	$C_{20}H_6Br_4O_5K_2$	724	s.	s.	s.
Eosine, Red Shade (Tetra Brom.-fluores. Sod.)	$C_{20}H_6Br_4O_5Na_2$	692	s.	s.	s.
Epsom Salt (see Magnesium Sulphate)					
Erythrosine M. (Tetra Iodo-fluoresceine Potassium or Sodium)	$C_{20}H_6I_4O_5K_2$ or Na_2	912 or 880	s.	s.	s.
Erythrosine G. (Di-iodo-fluoresceine Potassium or Sodium)	$C_{20}H_6I_2O_5K_2$ or Na_2	658 or 626	s.	s.	s.

Gelatine, Glutine	Unobtainable		sp s.	e. s.	n. s.
Glycerine	$C_3H_8O_3$	92	in all proportions.		
Glycine (Oxy-phenylglycine)	$C_8H_9O_3N$	162			
Gold, Neutral Chloride	$AuCl_3$	302.5	1	5	also in ether.
" and Cadmium Chloride	$AuCl_5Cd$	485.5	s.	s.	s.
" and Potassium Chloride	$AuCl_4K+5H_2O$	467	s.	s.	s.
" and Sodium Chloride	$AuCl_4Na+2H_2O$	397	s.	s.	s.
" Sodium Hyposulphite	$AuNa_3S_4O_6+2H_2O$	525	s.	s.	s.
Gun Cotton (Tetra-nitrate Cellulose)	$C_{12}H_{16}O_6(NO_3)_4$	504	n. s.	n. s.	in ether
" " (Tri-nitrate Cellulose)	$C_{10}H_{17}O_7(NO_6)_3$	579	n. s.	n. s.	alcohol
Hydrochinone	$C_6H_6O_2$	110	s.	s.	also in ether.
Hydroxylamine Hydrochlorate	NH_3OHCl	69.5	0.6	e. s.	4
Iodine	I	127	sp s.	sp. s.	e. s.
Iridium Tetra Chloride	$IrCl_4$	335			
Iron, Ammonium Sulphate	$FeSO_4(NH_4)_2SO_4+6H_2O$	392	v. s.	dec.	n. s.
" Chloride (Ferric)	Fe_2Cl_6	325	.75	.5	1 in 1
" Chloride (Ferrous)	Fe_2Cl_2	127	2	1	1 in 1
" Citrate	$Fe_2(C_6H_5O_7)_2$	490	s.	s.	n. s.
" Citrate and Ammonium	$Fe_2(C_6H_5O_7)_2+(NH_4)_3$	544	s.	s.	sp. s.
" Iodide	FeI_2+4H_2O	382	v. s.	v. s.	v. s.
" Nitrate	$Fe(NO_3)_2+6H_2O$	288	v. s.	dec.	dec.
" Oxalate (Ferric)	$Fe_2(C_2O_4)_3$	376	s.	s.	n. s.
" " (Ferrous)	FeC_2O_4	144	in potassium oxal.		n. s.
" Sulphate (Ferric)	$Fe_2(SO_4)_3+9H_2O$	566	s.	dec.	s.
" " (Ferrous)	$FeSO_4+7H_2O$	278	1.5	1	n. s.
Kaoline	$Al_2Si_2O_7+2H_2O$	258.8	not soluble.		
Lead, Acetate (see Sugar of Lead)	$Pb(C_2H_3O_2)_2$	325	2.5	2	1 in 12.5
" Carbonate	$PbCO_3$	267	n. s.	sp. s.	n. s.
" Iodide	PbI_2	461	s.	s.	n. s.
' Nitrate	$Pb(NO_3)_2$	331	7.7	7	s.
" Oxide	PbO	223	n. s.	n. s.	Alkalis.
Lithium, Bromide	$LiBr$	87	.66	.5	v. s.
" Chloride	$LiCl+H_2O$	60.5	1.3	1	s.
" Iodide	$LiI+3H_2O$	188	.61	.5	s.
Magnesium, Bromide	$MgBr_2$	184.4	1	.75	s.

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Magnesium, Chloride	$MgCl_2$	95.4	2	1.5	s.
" Iodide	MgI_2	278.4	1	.75	v. s.
" Sulphate (see Epsom Salt	$MgSO_4,7H_2O$	246.4	1.3	1	sp. s.
Manganous Chloride	$MnCl_2+4H_2O$	198	s.	s.	n s.
Mercury, Chloride (Mercuric) (see Corr. Subl)	$HgCl_2$	271	19	3	5
" " (Mercurous) (see Calomel)	Hg_2Cl_2	471	n. s.	n. s.	n. s.
" Cyanide	$HgCy_2$ or $(CN)_2$	252	8	2	1 in 20
" Iodide (Mercuric)	HgI_2	454	sp. s.	sp. s.	sp. s
" " (Mercurous)	Hg_2I_2	654	n. s.	n. s.	n. s.
Metol (Mono-methyl Para-amidometakresol)	$C_8H_{11}NO$	137	s.	s.	s.
Para-amidophenol	C_6H_7NO	109	sp. s.	s.	....
Para-amidophenol Sodium	C_6H_6NaNO	131	easily	soluble.	....
Para-amidophenol Hydrochlorate	C_6H_7NOHCl	145.5	s.	s.	s.
Para-rosaniline (Triamido-phenyl-Carbinol)	$C_{19}H_{19}N_3O$	305	....	....	....
Phenol (see Carbolic Acid)	....	....	....	....	....
Platino-potassium Chloride or Chloro-platinite	K_2PtCl_4	417.4	6.	....	s.
Platino-sodium Chloride or Chloro-platinite of Sodium	Na_2PtCl_4	385.4	solu	ble.	....
Platinum Chloride	$PtCl_4+5H_2O$	429.4	....	*	....
Potassa (see Potassium Hydrate)	....	....	....	....	....

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* Real platinum-chloride is but little soluble in water; the article of commerce of that name answers to the formula $PtCl_4 2HCl+6H_2O$, and is of the atomic weight 520.4 (K. Schwier). It is easily soluble in water, probably in the proportion of 1.6.

Potassium, Aluminium Sulphate (see Alum)					
" Bicarbonate	$KHCO_3$	100	3	2	n. s
" Bichromate	$K_2Cr_2O_7$	294.4	10	7	n. s.
" Bromide	KBr	119	2	1	1 in 90
" Carbonate	K_2CO_3	138	.75	.5	n. s.
" Chlorate	$KClO_3$	122.5	16	2	n. s.
" Chloride	KCl	74.5	3	2	sp. s.
" Chromic Sulph. (see Chrome Alum)					
" Citrate	$K_3C_6H_7O_8$	324	6.6	.3	n. s.
" Cyanide	KCy or (CN)	65	1	.5	sp. s.
" Ferric Sulphate	$K_2SO_4+Fe_2(SO_4)_3+24H_2O$	957	s.	s.	n. s.
" Ferri-cyanide (see Red Prussiate)	K_3FeCy_6	329.3	2.5	1.2	n. s.
" Ferro-cyanide (see Yellow Pruss.)	$K_4FeCy_6+3H_2O$	422	3	1	n. s.
" Fluoride	KFl	58	v. s.	v. s.	v. s.
" Hydrate	KOH	56	.5	.25	sp. s.
" Iodide	KI	166	.75	.5	1 in 16
" Nitrate (see Saltpetre)	KNO_3	101	4	1	n. s.
" Oxalate	$K_2C_2O_4+2H_2O$	202	3	2	sp. s.
" Permanganate	$KMnO_4$	158	16	10	n. s.
" Sulpho-cyanate	$KCyS$	97	2	1	sp. s.
Pyrogallol (see Pyrogallic Acid)					
Rhodan (German appellation for Cyanates)					
Rodinal (ready-prepared Para-amido Devel.)					
Silver, Acetate	$AgC_2H_3O_2$	167	sp. s.	sp. s.	n. s.
" Bromide	$AgBr$	188	n. s.	n. s.	in HCl and HBr.
" Carbonate	Ag_2CO_3	276	n. s.	n. s.	n. s.
" Chloride	$AgCl$	143.5	n. s.	n. s.	Ammonia. cyan. potass. hyposulphite of soda.
" Citrate	$Ag_3C_6H_5O_7$	513	sp. s.	sp. s.	
" Fluoride	$AgFl$	127	v. s.	v. s.	v. s.
" Iodide	AgI	235	n. s.	n. s.	same as Chloride.
" Nitrate	$AgNO_3$	170	1	.5	sp. s.

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Silver, Nitrite	$AgNO_2$	154	300	dec.	n. s.
" Oxalate	$Ag_2C_2O_4$	302	sp. s.	s.	n. s.
" Oxide	Ag_2O	232	n. s.	n. s.	n. s.
" Sulphide	Ag_2S	248	n. s.	n. s.	n. s.
Soda, Caustic (see Sodium Hydrate)					
Sodium Acetate	$NaC_2H_3O_2+3H_2O$	136	3	.66	n. s.
" Biborate (Borax)	$Na_2B_4O_7+10H_2O$	382	12.5	2	n. s.
" Bromide	$NaBr$	103	1.25	1	1.16
" Bicarbonate	$NaHCO_3$	84	12	dec.	n. s.
" Carbonate	$Na_2CO_3+10H_2O$	286	2	1	n. s.
" Chloride	$NaCl$	58.5	2.75	2.75	n. s.
" Citrate	$Na_3C_6H_5O_7$	258	1	.5	sp. s.
" Hydrate	$NaHO$	40	1.5	.5	sp. s.
" Hypo-sulphite	$Na_2S_2O_3+5H_2O$	248	1.5	1	sp. s.
" Iodide	NaI	150	.5	.3	sp. s.
" Nitrate	$NaNO_3$	85	1.36	1	1 in 37
" Sulph-antimoniate or Schlippe's Salt.	Na_3SbS_4	317	s.	s.	n. s.
" Sulphate	$Na_2SO_4+10H_2O$	322	2	4	s.
" Sulphide	Na_2S+9H_2O	240	s.	s.	sp. s.
" Sulphite	$Na_2SO_3+7H_2O$	252	4	2	sp. s.
" Tungstate	$Na_2WO_4+2H_2O$	330	s.	s.	n. s.
" Thio-sulphate (see Hypo-sulphite)					
Strontium, Bromide	$SrBr_2+6H_2O$	355.5	1	.75	sp. s.
" Chloride	$SrCl_2+6H_2O$	266.5	1.8	1	sp. s.

Strontium, Nitrate	$Sr(NO_3)_2$	211.5	5	2	sp. s.
Sugar of Lead (see Lead Acetate)					
Tannin (see Digallic Acid)					
Thymol	$C_6H_3(CH_3(C_3H_7)COO$	177	sp.		and in ether.
Tin, Chloride (Stannic)	$SnCl_4$	260	dec.	in much	water.
" Chloride (Stannous)	$SNCl_2+2H_2O$	225	135:100	655:100	v. s.
Uranium, Bromide	UBr_2+4H_2O	472	1	.5	sp. s.
" Nitrate	$UO_2(NO_3)_2+6H_2O$	504	.5	.25	v. s.
" Sulphate	$UO_2SO_4+3H_2O$	422	.5	.25	v. s.
Verdigris (see Copper Acetate)					
Vitriol, Blue (see Copper Sulphate)					
" Green (see Iron Sulphate)					
" White (see Zinc Sulphate)					
Water	H_2O	18			
Washing Soda (see Sodium Carbonate)					
Wood Alcohol (see Alcohol Methyl)					
Zinc, Bromide	$ZnBr_2$	225	del.	and e. s.	s.
" Chloride	$ZnCl_2$	136	.33		s.
" Iodide	ZnI_2	319	.33	dec.	v. s.
" Nitrate	$Zn(NO_3)_2+6H_2O$	297	del.	del.	del
" Sulphate (see White Vitriol)	$ZnSO_4+7H_2O$	287	2	1	n. s.
Zircon Earth	ZrO_2	122	n. s.	n. s.	n s.

Relative Brilliancy of Artificial Lights.

No.		1	2	3	4	5	6	7	8	9
1	Sun at Midday, June 21,—1	1	......	......	......	......	......	......	......	......
2	Light of Magnesium Lamp (burning 1 gram of powder)	3	1	......	......	......	......	......	......	......
3	Magnesium Ribbon, 3 mm. wide	14	5	1	......	......	......	......	......	......
4	Electric Arc Lamp	35	11	2.5	1	......	......	......	......	......
5	Oxyhydrogen Light	50	16	3.6	1.4	1	......	......	......	......
6	Gas, Welsbach System	165	53	11	7	10	1	......	......	......
7	Incandescent Electric Lamp, (24 volts)	1,600	533	115	46	32	10	1	......	......
8	Oil of Petroleum Lamp	2,300	766	165	66	46	14	1.4	1	......
9	Stearine Candle	18,000	6,000	1,300	515	360	109	11	7	1

By means of this table, the nine chief sources of light above given can be compared with each other as to their relative brilliancy.

Example.—Compared with the sun, the Welsbach Gas Light is 165 less brilliant, but is 10 times more brilliant than the electric incandescent lamp, and 109 more brilliant than the light from a stearine candle.

Elsden's Table of Poisons and Antidotes.

	POISONS.	REMARKS.	CHARACTERISTIC SYMPTOMS.	ANTIDOTE.
Vegetable Acids.	OXALIC ACID. including POTASSIUM OXALATE.	1 dram is the smallest fatal dose known.	Hot, burning sensation in throat and stomach; vomiting, cramps, and numbness.	Chalk, whiting or magnesia, suspended in water. Plaster or mortar can be used in emergency.
Caustic Alkalies.	AMMONIA. POTASH. SODA.	Vapor of ammonia may cause inflammation of the lungs.	Swelling of tongue, mouth, and fauces; often followed by stricture of the œsophagus.	Vinegar and water.
Metallic Salts.	MERCURIC CHLORIDE.	3 grains the smallest known fatal dose.	Acrid, metallic taste, constriction and burning in throat and stomach, followed by nausea and vomiting.	White and yolk of raw eggs with milk. In emergency, flour paste may be used.
	ACETATE OF LEAD.	The sub-acetate is still more poisonous.	Constriction in the throat and at pit of stomach; crampy pains and stiffness of abdomen; blue line round the gums.	Sulphates of soda or magnesia. Emetic of sulphate of zinc.
	CYANIDE OF POTASSIUM.	*a.* Taken internally, 3 grs. fatal.	Insensibility, slow, gasping respiration, dilated pupils, and spasmodic closure of the jaws.	No certain remedy; cold affusion over the head and neck most efficacious.
		b. Applied to wounds and abrasures of the skin.	Smarting sensation.	Sulphate of iron should be applied immediately.
	BICHROMATE OF POTASSIUM	*a.* Taken internally. *b.* Applied to slight abrasions of the skin.	Irritant pain in stomach, and vomiting. Produces troublesome sores and ulcers.	Emetics and magnesia, or chalk.
	NITRATE OF SILVER.		Powerful irritant.	Common salt to be given immediately, followed by emetics.
Concentrated Mineral Acids.	NITRIC ACID.	2 drams have been fatal. Inhalation of the fumes has also been fatal.	Corrosion of windpipe and violent inflammation.	Bicarbonate of soda, or carbonate of magnesia or chalk, plaster of the apartment beaten up in water.
	HYDROCHLORIC ACID.	¼ ounce has caused death.		
	SULPHURIC ACID.	1 dram has been fatal.		
	ACETIC ACID, concentrated, has as powerful an effect as the mineral acids.			
	IODINE.	Variable in its action; 3 grains have been fatal.	Acrid taste, tightness about the throat, vomiting.	Vomiting should be encouraged, and gruel, arrowroot and starch given freely.
	ETHER.	When inhaled.	Effects similar to chloroform.	Cold affusion and artificial respiration.
	PYROGALLOL.	2 grains sufficient to kill a dog.	Resemble phosphorus poisoning.	No certain remedy. Speedy emetic desirable.

PASTE THIS TABLE UP IN YOUR WORKROOM.

Treatment of Residues.

NATURE OF WASTE.	TREATMENT.	RESULT OF OPERATION.	EXTRACTION OF PRECIOUS METAL.
Old hypo and fixing baths.	Add a small quantity of a strong solution of potassium sulphide, and silver will be precipitated in the form of a dense brown flucculent cloud; which stir, and allow to settle.	Collect the resulting precipitate of sulphide of silver, and allow to dry.	Mix with equal weight of sodium carbonate, 2 parts, potassium nitrate, 1 part, and fuse in a crucible.
Solid residues (cuttings of silver paper, old filters, etc.).	Burn.	Collect the ashes.	Mix with equal weight of sodium carbonate, 2 parts, potassium nitrate, 1 part, and fuse in a crucible.
Old combined toning and fixing sulpho-cyanide baths.	Add a small quantity of hydrochloric acid and ferrous sulphate, which give a precipitate of metallic gold mixed with hydrous perchloride of iron.	Collect, and dry.	Fuse in a crucible to collect the gold and silver.
Old platinotype baths (oxalate of potassium).	Add to each liter (1,000 cc.) of old oxalate bath, 330 cc. of a concentrated solution of sulphate of iron, and heat to boiling point.	The resulting black precipitate is pure platinum.	Collect, wash well. and dry on a filter.
Acid fixing baths (platinotype process).	Add ferrous developing solution.	Metallic platinum is formed (mixed with small quantity of iron.	Eliminate the iron by treating with sulphuric acid, then wash.
Silver from sensitive films.	Place sensitized plates, etc., in 100 cc. of hydrochloric acid; pour the whole into a beaker, and add 100 cc. of sulphuric acid, and heat.	Silver forms at the bottom of the beaker; allow to settle, and decant.	The residue is mixed with 5 parts of charcoal and 70 parts of sawdust, and heated to bright red in a crucible for an hour. A button of silver will be found at the bottom after the operation.

ADOLESCENCE
Charles O. Axell

United States Weights and Measures.

ACCORDING TO EXISTING STANDARDS.

LINEAL.

12 inches = 1 foot.
3 feet = 1 yard.
5.5 yards = 1 rod.
40 rods = 1 furlong.
8 furlongs = 1 mile.

Inches.		Feet.		Yards.		Rods.		Fur's.		Mile.
12	=	1								
36	=	3	=	1						
198	=	16.5	=	5.5	=	1				
7,920	=	660	=	220	=	40	=	1		
63,360	=	5,280	=	1,760	=	320	=	8	=	1

SURFACE—LAND.

144 sq. ins. = 1 sq ft.
9 sq. ft. = 1 sq. yard.
30.25 sq. yds. = 1 sq. rod.
40 sq. rods = 1 sq. rood.
4 sq. roods = 1 acre.
640 acres = 1 sq. mile.

Feet.		Yards.		Rods.		Roods.		Acres.
9	=	1						
272.25	=	30.25	=	1				
10,890	=	1,210	=	40	=	1		
43,560	=	4,840	=	160	=	4	=	1
27,878,400	=	3,097,600	=	102,400	=	2,560	=	640

VOLUME—LIQUID.

4 gills = 1 pint.
2 pints = 1 quart.
4 quarts = 1 gallon.

Gills.		Pints.		Gallon.		Cub. In.
32	=	8	=	1	=	231

FLUID.

Gallon.		Pints.		Ounces.		Drachms.		Minims.		Cubic Centimetres.
1	=	8	=	128	=	1,024	=	61,440	=	3,785.435
		1	=	16	=	128	=	7,680	=	473.179
				1	=	8	=	480	=	29.574
						1	=	60	=	3.697

16 ounces, or a pint, is sometimes called a fluid pound.

TROY WEIGHT.

Pound.		Ounces.		Pennyweights.		Grains.		Grams.
1	=	12	=	240	=	5,760	=	373.24
		1	=	20	=	480	=	31.10
				1	=	24	=	1.56

APOTHECARIES' WEIGHT.

lb. Pound.		℥ Ounces.		ʒ Drachms.		℈ Scruples.		gr. Grains.		Grams.
1	=	12	=	96	=	288	=	5,760	=	373.24
		1	=	8	=	24	=	480	=	31.10
				1	=	3	=	60	=	3.89
						1	=	20	=	1.30
								1	=	.06

The pound, ounce, and grain are the same as in Troy weight.

AVOIRDUPOIS WEIGHT.

Pound.		Ounces.		Drachms.		Grains (Troy).		Grams.
1	=	16	=	256	=	7,000	=	453.60
		1	=	16	=	437.5	=	28.35
				1	=	27.34	=	1.77

English Weights and Measures.

APOTHECARIES' WEIGHT.

20 Grains = 1 Scruple = 20 Grains.
3 Scruples = 1 Drachm = 60 Grains.
8 Drachms = 1 Ounce = 480 Grains.
12 Ounces = 1 Pound = 5760 Grains.

FLUID MEASURE.

60 Minims = 1 Fluid Drachm
8 Drachms = 1 Fluid Ounce.
20 Ounces = 1 Pint.
8 Pints = 1 Gallon.

The above weights are usually adopted in formulas.

All Chemicals are usually sold by

AVOIRDUPOIS WEIGHT.

$27\frac{11}{32}$ Grains = 1 Drachm = $27\frac{11}{32}$ Grains.
16 Drachms = 1 Ounce = $437\frac{1}{2}$ Grains.
16 Ounces = 1 Pound = 7000 Grains.

Precious Metals are usually sold by

TROY WEIGHT.

24 Grains = 1 Pennyweight = 24 Grains.
20 Pennyweights = 1 Ounce = 480 Grains.
12 Ounces = 1 Pound = 5760 Grains.

NOTE.—An ounce of metallic silver contains 480 grains, but an ounce of nitrate of silver contains only 437½ grains.

United States Fluid Measure.

Gal.	Pints.	Ounces.	Drachms.	Mins.	Cub. In.	Grains.	Cub. C.M.
1 =	8 =	128 =	1,024 =	61,440 =	231. =	58,328.886 =	3,785.44
	1 =	16 =	128 =	7,680 =	28.875 =	7,291.1107 =	473.18
		1 =	8 =	480 =	1.8047 =	455.6944 =	29.57
			1 =	60 =	0.2256 =	56.9618 =	3.70

Imperial British Fluid Measure.

Gal.	Pints.	Ounces.	Drachms.	Mins.	Cub. In.	Grains.	Cub. C.M.
1 =	8 =	160 =	1,280 =	76,800 =	277.27384 =	70,000 =	4,543.732
	1 =	20 =	160 =	9,600 =	34.65923 =	8,750 =	567.966
		1 =	8 =	480 =	1.73296 =	437.5 =	28.398
			1 =	60 =	0.21662 =	54.69 =	3.550

Metric System of Weights and Measures.

MEASURES OF LENGTH.

Denominations and Values.		Equivalents in Use.	
Myriameter	10,000 meters.	6.2137	miles.
Kilometer	1,000 meters.	.62137	mile, or 3,280 ft. 10 ins.
Hectometer	100 meters.	328.	feet and 1 inch.
Dekameter	10 meters.	393.7	inches.
Meter	1 meter.	39.37	inches.
Decimeter	1-10th of a meter.	3.937	inches.
Centimeter	1-100th of a meter.	.3937	inch.
Millimeter	1-1000th of a meter.	.0394	inch.

MEASURES OF SURFACE.

Denominations and Values.		Equivalents in Use.	
Hectare	10,000 square meters.	2.471	acres.
Are	100 square meters.	119.6	square yards.
Centare	1 square meter.	1,550.	square inches.

MEASURES OF VOLUME.

Denominations and Values.			Equivalents in Use.			
Names.	No. of Liters.	Cubic Measures.	Dry Measure.		Wine Measure.	
Kiloliter or stere	1,000	1 cubic meter.	1.308	cubic yards.	264.17	gallons.
Hectoliter	100	1-10th cubic meter.	2	bu. and 3.35 pecks.	26.417	gallons.
Dekaliter	10	10 cubic decimeters.	9.08	quarts.	2.6417	gallons.
Liter	1	1 cubic decimeter.	.908	quart.	1 0567	quarts.
Deciliter	1-10	1-10th cubic decimeter.	6.1023	cubic inches.	.845	gill.
Centiliter	1-100	10 cubic centimeters.	.6102	cubic inch.	.338	fluid oz.
Milliliter	1-1000	1 cubic centimeter.	.061	cubic inch.	.27	fl. drm.

WEIGHTS.

Denominations and Values.			Equivalents in Use.	
Names.	Number of Grams.	Weight of Volume of Water at its Maximum Density.	Avoirdupois Weight.	
Millier or Tonneau	1,000,000	1 cubic meter.	2204.6	pounds.
Quintal	100,000	1 hectoliter.	220.46	pounds.
Myriagram	10,000	10 liters.	22.046	pounds.
Kilogram or Kilo	1,000	1 liter.	2.2046	pounds.
Hectogram	100	1 deciliter.	3.5274	ounces.
Dekagram	10	10 cubic centimeters.	.3527	ounce.
Gram	1	1 cubic centimeter.	15.432	grains.
Decigram	1-10	1-10th of a cubic centimeter.	1.5432	grain.
Centigram	1-100	10 cubic millimeters.	.1543	grain.
Milligram	1-1000	1 cubic millimeter.	.0154	grain.

For measuring surfaces, the square dekameter is used under the term of ARE; the hectare, or 100 ares, is equal to about 2½ acres. *The unit of capacity* is the cubic decimeter or LITER, and the series of measures is formed in the same way as in the case of the table of lengths. The cubic meter is the unit of measure for solid bodies, and is termed STERE. *The unit of weight* is the GRAM, which is the weight of one cubic centimeter of pure water weighed in a vacuum at the temperature of 4 deg. Cent. or 39.2 deg. Fahr., which is about its temperature of maximum density. In practice, the term cubic centimeter abbreviated c.c, is generally used instead of milliliter, and cubic meter instead of kiloliter.

The Conversion of French (Metric) into English Measure.

1	cubic centimeter	=	17	minims.							
1	cubic centimeters	=	34	"							
3	"	=	51	"							
4	"	=	68	"	or	1	dram	8	minims.		
5	"	=	85	"	"	1	"	25	"		
6	"	=	101	"	"	1	"	41	"		
7	"	=	118	"	"	1	"	58	"		
8	"	=	135	"	"	2	drams	15	"		
9	"	=	152	"	"	2	"	32	"		
10	"	=	169	"	"	2	"	49	"		
20	"	=	338	"	"	5	"	38	"		
30	"	=	507	"	"	1	ounce	0	dram	27	minims
40	"	=	676	"	"	1	"	3	drams	16	"
50	"	=	845	"	"	1	"	6	"	5	"
60	"	=	1014	"	"	2	ounces	0	"	54	"
70	"	=	1183	'	"	2	"	3	"	43	"
80	"	=	1352	"	"	2	"	6	"	32	"
90	"	=	1521	"	"	3	"	1	"	21	"
100	"	=	1690	"	"	3	"	4	"	10	"
1000	"	=	1 liter = 34 fluid ounces nearly, or 2⅛ pints.								

The Conversion of French (Metric) into English Weight.

The following table, which contains no error greater than one-tenth of a grain, will suffice for most practical purposes:

1	gram	=	15⅖	grains.						
2	grams	=	30⅘	"						
3	"	=	46⅕	"						
4	"	=	61⅘	"	....	or	1	dram	1⅘	grain.
5	"	=	77⅕	"	....	"	1	"	17⅕	grains.
6	"	=	92⅗	"	....	"	1	"	32⅗	"
7	"	=	108	"	....	"	1	"	48	"
8	"	=	123⅖	"	....	"	2	drams	3⅖	"
9	"	=	138⅘	"	....	"	2	"	18⅘	"
10	"	=	154⅖	"	....	"	2	"	34⅖	"
11	"	=	169⅘	"	....	"	2	"	49⅘	"
12	"	=	185⅕	"	....	"	3	"	5⅕	"
13	"	=	200⅗	"	....	"	3	"	20⅗	"
14	"	=	216	"	....	"	3	"	36	"
15	"	=	231⅖	"	....	"	3	"	51⅖	"
16	"	=	247	"	....	"	4	"	7	"
17	"	=	262⅖	"	....	"	4	"	22⅖	"
18	"	=	277⅘	"	....	"	4	"	37⅘	"
19	"	=	293⅕	"	....	"	4	"	53⅕	"
20	"	=	308⅗	"	....	"	5	"	8⅗	"
30	"	=	463	"	....	"	7	"	43	"
40	"	=	617⅕	"	....	"	10	"	17⅕	"
50	"	=	771⅗	"	....	"	12	"	51⅗	"
60	"	=	926	"	....	"	15	"	26	"
70	"	=	1080⅕	"	....	"	18	"	0⅕	"
80	"	=	1234⅗	"	....	"	20	"	34⅗	"
90	"	=	1389	"	....	"	23	"	9	"
100	"	=	1543⅕	"	....	"	25	"	43⅕	"
1000	"	=	1 kilogram = 32 oz., 1 dr., 12⅖ gr.							

"Uniform System" Numbers for Stops from $\frac{f}{1}$ to $\frac{f}{100}$.

In the following table Mr. S. A. Warburton has calculated the exposure necessary with every stop from $\frac{f}{1}$ to $\frac{f}{100}$ compared with the unit stop of the "uniform system" of the Photographic Society of Great Britain. The figures which are underlined show in the first column what $\frac{f}{a}$ must be in order to increase the exposure in geometrical ratio from $\frac{f}{4}$, the intermediate numbers showing the uniform system number for any other aperture.

f	U. S. No.	*f*	U. S. No.	*f*	U. S. No.
1	$\frac{1}{16}$	15	14.06	58	210.25
1¼	.097	16	16	59	217.56
1.414	⅛	17	18.06	60	225.00
1½	.140	18	20.25	61	232.56
1¾	.191	19	22.56	62	240.25
2	¼	20	25.00	63	248.06
2¼	.316	21	27.56	64	256
2½	.390	22	30.25	65	264.06
2.828	½	22.62	32	66	272.25
2¾	.472	23	33.06	67	280.56
3	.562	24	36.00	68	289.00
3¼	.660	25	39.06	69	297.56
3½	.765	26	42.25	70	306.25
3¾	.878	27	45.56	71	315.06
4	1.00	28	49.00	72	324.00
4¼	1.12	29	52.56	73	333.06
4½	1.26	30	56.25	74	342.25
4¾	1.41	31	60.06	75	351.56
5	1.56	32	64	76	361.00
5¼	1.72	33	68.06	77	370.56
5½	1.89	34	72.25	78	380.25
5.656	2	35	76.56	79	390.06
5¾	2.06	36	81.00	80	400.00
6	2.25	37	85.56	81	410.06
6¼	2.44	38	90.25	82	420.25
6½	2.64	39	95.06	83	430.56
6¾	2.84	40	100.00	84	440.00
7	3.06	41	105.06	85	451.56
7¼	3.28	42	110.25	86	462.25
7½	3.51	43	115.56	87	473.06
7¾	3.75	44	121.00	88	484.00
8	4	45	126.56	89	495.06
8¼	4.25	45.25	128	90	506.25
8½	4.51	46	132.25	90.50	512
8¾	4.78	47	138.06	91	517.56
9	5.06	48	144.00	92	529.00
9¼	5.34	49	150.06	93	540.56
9½	5.64	50	156.25	94	552.25
9¾	5.94	51	162.56	95	564.06
10	6.25	52	169.00	96	576.00
11	7.56	53	175.56	97	588.06
11.31	8	54	182.25	98	600.25
12	9.00	55	189.06	99	612.56
13	10.56	56	196.00	100	625.00
14	12.25	57	203.06		

Comparative Exposures of Various Subjects.

	Seconds.
Open panorama, with fields and trees	1
Snow, ice, marine views	1
Panorama, with houses, etc.	2
Banks of rivers	3
Groups and portraits in open air (diffused light)	6
Underneath open trees	6
Groups under cover	10
Beneath dense trees.	10
Ravines, excavations	10
Portraits in light interiors	10
Portraits taken 4 feet from a window, indoors, diffused light	30

A Table Showing the Correct Exposure that Should be Given for Various Moving Objects.

By W. D. Kilbey.

The table is made out for a distance from the camera 100 times that of the focus of the lens; that is, for a 6-inch focus lens at 50 feet, a 7-inch at 58 feet, an 8-inch at 67 feet, a 9-inch at 75 feet, or 12-inch at 100 feet.

	Towards the Camera.	At Right Angles to the Camera
Man walking slowly, street scenes	$\frac{1}{15}$ sec.	$\frac{1}{45}$ sec.
Cattle grazing	$\frac{1}{15}$ "	$\frac{1}{45}$ "
Boating	$\frac{1}{20}$ "	$\frac{1}{60}$ "
Man walking, children playing, etc.	$\frac{1}{40}$ "	$\frac{1}{120}$ "
Pony and trap, trotting	$\frac{1}{100}$ "	$\frac{1}{300}$ "
Cycling, ordinary	$\frac{1}{100}$ "	$\frac{1}{300}$ "
Man running a race and jumping	$\frac{1}{150}$ "	$\frac{1}{450}$ "
Cycle racing	$\frac{1}{200}$ "	$\frac{1}{600}$ "
Horses galloping	$\frac{1}{200}$ "	$\frac{1}{600}$ "

If the object is twice the distance, the length of allowable exposure is doubled, and *vice versa.*

Freezing Mixtures.

PARTS. Reducing the Temperature	From Degrees of the Celsius	To Thermometer
3 Nitrate of sodium + 4 Water	+13.2 deg.	— 5.3 deg.
9 Phosphate of sodium + 4 dilute Nitric acid	+10 "	— 9 "
3 Sulphate of sodium + 2 dilute Nitric acid	+10 "	—10 "
1 Nitrate of sodium + 4 Water		—10.6 "
1 Chloride of potassium + 4 Water		—11.8 "
5 Sal ammoniac + 5 Saltpetre + 16 Water	+10 deg.	—12 "
1 Nitrate of ammonia + 1 Water	+10 "	—15.5 "
8 Sulphate of sodium + 5 conc. Sulphuric acid.	+10 "	—17 "
1 Sulphocyanate of Potass. + 1 Water	+18 "	—21 "
1 Chloride of sodium + 3 Snow		—21 "
1 Sal ammoniac + 1 Saltpetre + 1 Water	+ 8 deg.	—24 "
3 Crystal. chloride of calcium + 1 Snow		—36 "
1 Snow + 1 dilute Sulphuric acid	— 5 deg.	—41 "

AMERICAN PHOTOGRAPHIC SOCIETIES.

AKRON CAMERA CLUB—Akron, Ohio. Established 1890. Headquarters, Y. M. C. A. Building. Membership, 56. Date of meetings, second and last Tuesday in each month. *President,* Rev. E. G. Mason, 262 Spicer Street. *Secretary,* John W. Schuler, 150 Park Place. Date of annual exhibition, March or April.

ALTOONA CAMERA AND ART CLUB—Altoona, Pa. Established October, 1900. Headquarters, Mechanics' Library. Membership, 12. Date of meetings, first and third Tuesday in each month. *President,* Horace R. Smith, M. D. *Secretary,* W. J. Hamer. Date of annual exhibition, November.

AMATEUR PHOTOGRAPHIC ASSOCIATION—Selma, Ala. Established December 29, 1887. Headquarters, 916 Broad Street. Membership, 28. Date of meetings, first Friday each month. *President,* William S. Monk, Selma, Ala. *Secretary,* S. Orlando Trippe, Selma, Dallas Co., Alabama.

AMERICAN INSTITUTE (PHOTOGRAPHIC SECTION)—New York City. Established March 26, 1859. Headquarters, 19-21 West 44th Street. *President,* Oscar G. Mason. *Vice-President,* Robert A. B. Dayton. Treasurer, James Y. Watkins. *Secretary,* John W. Bartlett, M. D., F. R. P. S., 149 West 94th Street. Meets twice each month during the winter.

AMERICAN LANTERN SLIDE INTERCHANGE—New York. Principal office, 361 Broadway. Organized 1885. *General Manager,* F. C. Beach. Membership 20 clubs. *Board of Managers,* F. C. Beach, New York; John P. Zermer, Buffalo, N. Y.; O. C. Reiter, Pittsburg, Pa.; R. H. Terhune, Orange, N. J.; Herbert F. Smith, Syracuse, N. Y. Annual meeting, December of each year.

ASACOG CAMERA CLUB.—Brooklyn, N. Y. Established April 10, 1901. Not incorporated. Headquarters, 52 Sands Street. Date of meetings, every Wednesday evening, 8 o'clock. *President,* George Creighton, 21 Water Street. *Secretary,* Eivar Harris, 101 Bridge Street. Date of annual exhibition, unsettled.

ASSOCIATION CAMERA CLUB—Marion, Ohio. Established April, 1900. Headquarters, Y. M. C. A. Building. Membership, 19. Date of meetings, first and third Tuesday in each month. *President,* O. E. Kennedy. *Secretary,* H. J. Mantz. Exhibitions at Y. M. C. A., January 1st.

ATHENS CAMERA CLUB.—Athens, Pa. Established May, 1901. Headquarters 311 South Main Street. Membership, 15. Date of meetings, every Wednesday. *President,* Louis J. Fitler, 120 South Keystone Avenue, Sayre, Pa. *Secretary,* Irving K. Park, 707 South Main Street, Athens, Pa.

BAY SHORE CAMERA CLUB—Bay Shore, L. I. Established 1899. Headquarters, Robbins Block. Membership, 67. Date of meetings, second Monday in each month. *President,* Howard M. Ross. *Secretary,* Howard R. Glutzbeck, Bay Shore, L. I. Exhibitions, annually.

BOSTON CAMERA CLUB—Boston, Mass. Established 1881. Incorporated, 1886. Headquarters, 50 Bromfield Street, Mass. Membership, 120. Date of meetings, first Mondays. *President,* William R. Cabot, 141 Milk Street, Boston. *Secretary,* John H. Thurston, 50 Bromfield Street. Date of annual exhibition, spring.

BROCKTON CAMERA CLUB—Brockton, Mass. Established April, 1894. Headquarters, Arcade Building. Membership, 50. Date of meetings, third Friday each month. *President,* S. H. Eaton, 128 Winfield Road. *Secretary,* Ebon T. Wood, Box 73 Campello, Mass. Date of meeting, third Friday each month. Date of annual exhibition, third week in April.

BROOKLYN ACADEMY OF PHOTOGRAPHY—Brooklyn, N. Y. Organized and incorporated February 16, 1887. Headquarters, 177 Montague Street. Membership, 60. Date of meetings, first Monday in each month. *President,* Dr. John Merritt. *First Vice-President,* A. N. Cook. *Second Vice-President,* M. R. Jones. *Recording Secretary,* H. W. Hodges. *Corresponding Secretary,* G. A. Williams. *Treasurer,* Wm. I. Wintringham. *Librarian,* Russell E. Prentiss. Date of annual exhibition, in May.

BROOKLYN CAMERA CLUB—Brooklyn. Established February 2, 1900. Incorporated February 19, 1900. Headquarters, 776 Manhattan Avenue. Membership, 41. Date of meetings, first Wednesday each month. *President,* Wm. T. Knol, 279 Washington Street, New York City. *Secretary,* N. Grant Dodson, 150 Noble Street. Date of annual exhibition, April 1.

BUFFALO CAMERA CLUB—Buffalo, N. Y. Established October, 1899. Headquarters, Central Y. M. C. A. Building. Membership, 75. Date of meetings, second and fourth Thursday of the month. *President,* W. H. Porterfield, 235 Hudson Street, Buffalo, N. Y. *Secretary,* S. S. Lloyd, 827 Prospect Avenue, Buffalo, N. Y. Date of annual exhibition, shortly after January 1st.

CAPE ANN CAMERA CLUB—119 Main Street, Gloucester. Established June 5, 1899. Incorporated December 26, 1903. Headquarters, 119 Main Street. Membership, 40 (limited to 40.) Date of meetings, first and third Friday in month. *President,* Dr. Percy C. Proctor, Gloucester, Mass. *Secertary,* Herman W. Spooner, 28 Granite Street, Gloucester, Mass. Date of annual exhibition, 15th of October.

CALIFORNIA CAMERA CLUB—San Francisco, Cal. Established March 18, 1890. Incorporated April 5, 1890. Headquarters, California Academy of Sciences Building, San Francisco, Cal. Membership, 325. Date of meetings, second Tuesday monthly. *President,* G. Knight White. *Secretary,* H. G. Aylsworth, 2206 Steiner Street, San Francisco, Cal. Date of annual exhibition, no set time.

CAMERA CLUB OF HARTFORD—Hartford, Conn. (Our affiliation with the Scientific Society ceased October 1st, 1905. Incorporated—We are taking up the old charter and name of The Camera Club of Hartford. Headquarters, not decided upon. Membership, about 100. *President,* Dr. F. S. Crossfield, 75 Pratt Street. *Secretary,* Clarence M. Rodgers, care of Hartford Steam Boiler I. & I. Co. Date of annual exhibition, April.

CAMERA CLUB, Y. M. C. A.—Hyde Park, Mass. Membership, 30. Date of meeting, every Saturday evening. Annual exhibition in November. Hyde Park Cross Country Club, merged into Y. M. C. A. Camera Club. *President,* F. R. Heustis. *Secretary,* John W. Logan, Hyde Park Y. M. C. A., Hyde Park, Mass.

"CAMERADS."—New Brunswich, N. J. Established April 24, 1890. Headquarters, corner Church and Neilson Streets. Membership, 30. *President,* Geo. K. Parsell, George Street. *Secretary,* Harvey Iredell, D. D. S., Lock Box, 34 New Brunswick, N. J.

CAPITAL CAMERA CLUB—Washington, D. C. Established May 1, 1891. Headquarters, 1010 F Street, N. W. Membership, 7, limited to 100. Date of meetings, first Saturday in each month. *President,* P. H. Christie. *Secretary,* T. Brook White, 603 Munsey Building, Washington, D. C. Date of annual exhibition, May.

CENTRAL BRANCH—502 Fulton Street, Brooklyn. Established 1890. Incorporated 1890. Headquarters, 502 Fulton Street. Membership, 37. Date of meetings, first and third Monday of each month. *President,* M. F. C. Surbeck, 99 Second Place, Brooklyn, N. Y. Secretary, Addison H. Ely, 185 Schermerhorn Street, Brooklyn. Date of annual exhibition, in the fall.

CENTRAL CAMERA CLUB—Brooklyn, N. Y. Established 1889. Headquarters, 502 Fulton Street. Membership, 42. Date of meetings, first and third Monday of each month. *President,* George H. Kutz. *Vice-President,* F. W. Surbeck. *Secretary,* Wm. S. Cole. *Treasurer,* John L. Freedlund. Date of annual exhibition, last week in October.

CENTURY CAMERA CLUB—Erie, Pa. Established 1900. Headquarters, 2207 Poplar Street. Date of meetings, second and fourth Tuesday of each month. *President,* Bert Gerred. *Secretary,* Gust. Holmquist, 2207 Poplar Street. Exhibitions, every quarter.

CHELTEN HILLS PHOTOGRAPHIC CLUB—Jenkintown, Penna. Membership, 25. *President,* J. W. Ridpath, 437 York Avenue, Jenkintown. *Secretary,* Grace Ridpath, 402 Walnut Street, Philadelphia. Annual exhibition in the Spring. Meeting upon call.

CHICAGO CAMERA CLUB—Chicago, Ill. Established February 14, 1904. Incorporated February 19, 1904. Headquarters, Northwestern University Building, Dearborn and Lake Streets. Date of meetings, first and third Thursday of each month. *President,* F. M. Tuckerman. *Secretary,* W. F. Ginrich, 485 Washington Boulevard. Annual exhibition, March (Salon).

COLUMBIA PHOTOGRAPHIC SOCIETY—Philadelphia, Pa. Established 1889. Incorporated July 3, 1894. Headquarters, 1811 North Broad Street, Philadelphia. Membership, 150. Date of meetings, first Monday of each month, business meetings; other Mondays, lecture or demonstrations. *President,* Dr. G. J. R. Miller, 1769 Frankford Avenue. *Secretary,* Daniel Baker, 1919 North 25th Street. Date of annual exhibition, January, prints. November, lantern slide.

COLUMBUS CAMERA CLUB—Columbus, Ohio. Date of meetings, every Tuesday evening. Membership, 25. *President,* J. E. Stearns. *Secretary,* W. Thune, 1158 Oak Street.

DAGUERRE CAMERA CLUB—Harbert, Mich. Established 1893. Headquarters, Harbert, Mich. Membership, about 24. Date of meetings, first Monday of month. *President,* F. Blish, Chicago. *Secretary,* Wells Sizer, Harbert, Mich.

EAST END CAMERA CLUB—Established April, 1900. Headquarters, Institute Rooms, Cedar Avenue, opposite Bertram Street. Membership, 30. Date of meetings, first Tuesday in each month. *President,* E. Sanderson. *Secretary,* A. S. Smith, 37 Kenwood Street.

EASTERN CAMERA CLUB—289 East 104th Street, New York. Established October, 1900. Headquarters, 241 East 104th Street, N. Y. Membership, 25. Date of meetings, first and third Tuesdays of month. *President,* A. W. Warden, 239 East 104th Street, New York. *Secretary-Treasurer,* Irving Bender, 239 East 118th Street, New York. Date of annual exhibition, indefinite.

ESSEX CAMERA CLUB—Newark, N. J. Established April, 1901. Headquarters, 33 Court Street, Newark, N. J. Membership, 70. Date of meetings, fourth Tuesday of every month. *President,* Frederick Keim. *Secretary,* Wm. R. Spear, 5 Bleecker Street, Newark, N. J. Date of annual exhibition, January.

GREENVILLE CAMERA CLUB—Jersey City, N. J. Established January, 1899. Headquarters, Club House at Greenville Schuetzen Park. Membership 18 (limited to 20.) Date of meetings, first Sunday in each month. *President,* William Rabidoux. *Secretary,* A. A. Langer, Club House. Annual meetings, Spring and Fall.

HAMILTON SCIENTIFIC ASSOCIATION, CAMERA SECTION—Hamilton, Can. Established April, 1891. Headquarters, Library Building, Main Street, West. Membership, 80. Date of meetings, second and fourth Mondays. *President,* Wm. Acheson, 314 Caroline Street, South. *Secretary,* Sinclair G. Richardson, Traders' Bank Building, King Street, West. Date of annual exhibition, last week of October.

HAVERHILL CAMERA CLUB—Haverhill, Mass. Established 1898. Headquarters, Daggett Building, Merrimack Street. Membership, 37 active; 1 honorary. Date of meetings third Tuesday, monthly. *President,* A. S. Bailey. *Secretary,* A. P. Heath, 104⅛ Merrimack Street. Date of annual exhibition, no set date.

HYDE PARK CAMERA CLUB—Hyde Park, Mass. Established May, 1905. Headquarters, Y. M. C. A. Building. Date of meetings, first Tuesday of each quarter, January, April, July, October. *President,* Rev. William F. Dusseault, Hyde Park. *Secretary,* Alexander Carberry, Y. M. C. A., Hyde Park.

INTERNATIONAL PHOTO PRINT EXCHANGE—Beach Bluff, Mass. Membership, 20, (limited to that number), each member in a different county. *Secretary* and *Treasurer,* Walter Sprague, Beach Bluff, Mass.

INTERNATIONAL PHOTOGRAPHIC EXCHANGE—San Francisco, Cal. Established February 21st, 1898. Headquarters, San Francisco, Cal. Membership, 1,400. A monthly publication, *The Photographic Exchange,* sent to all members. *President,* G. C. Kirkland, 3404 Franklin Street, Denver, Col. *Secretary,* Fayette J. Clute, Marye Terrace, San Francisco, Cal.

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KENSINGTON CAMERA CLUB—Philadelphia, Pa. Established April, 1900. Reorganized April, 1903. Headquarters, 2832 Kensington Avenue. Membership limited to 25. Date of meetings, second Tuesday of each month. *President,* Alfred Clegg. *Secretary,* Henry Elcock, 2422 N. Reese Street. Demonstrations and exhibitions, first, third and fourth Tuesday of each month, except June, July and August.

LANCASTER CAMERA CLUB—Lancaster, Pa. Established May 15, 1895. Headquarters, Rooms of Walter Meiser, West King Street. Membership 13. Date of meetings, first Thursday in each month. *President,* William S. Gleim. *Secretary,* F. A. Demuth, 114 East King Street.

LAWRENCE CAMERA CLUB—Lawrence, Mass. Established February 28, 1898, Headquarters (for correspondence), 29 Valley Street. Membership, 7. Date of meetings, second Monday of every month; annual meeting; second Monday in March. *President,* Robert D. Stevens. *Secretary,* William J. Prince, 29 Valley Street.

LOS ANGELES CAMERA CLUB—Los Angeles, Cal. Established December 1899. Incorporated May 1, 1900. Headquarters, 321 South Hill Street. Membership, 100. Date of meetings, second and fourth Friday in each month; social meetings, third Friday. *President,* F. Hammer Maude. *Corresponding Secretary,* Helen L. Davie.

MANUAL TRAINING HIGH SCHOOL CAMERA CLUB—Brooklyn, N. Y. Established 1895. Headquarters, 76 Court Street, room 18 in School Building. Membership, 65; alumni membership, 55. Date of meetings, first and third Thursday in each month. *President,* Richard Claggell. *Secretary,* Robert Redlefson, Manual Training High School. Exhibitions, Christmas vacation.

MANCHESTER (N. H.) CAMERA CLUB—Manchester, N. H. Established March, 1898. Headquarters, 64 Hanover Street. Membership, 25. Date of meetings, first Saturday in Jan., April, July and October. *President,* Louis E. Way, Manchester, N. H. *Secretary,* Fred T. Irwin, 351 Central Street, or P. O. Box 83, Manchester, N. H. Date of annual exhibition, no stated time.

MANUAL TRAINING HIGH SCHOOL CAMERA CLUB—Headquarters, Seventh Avenue and 4th Street, Brooklyn, N. Y. Membership 45. *President,* J. Pelletren. *Secretary,* Henry T. Weed, 7th Avenue and 41st Street, Brooklyn, N. Y. Meetings, first and third Wednesdays each month. Annual exhibition, Christmas week.

MANUAL TRAINING HIGH SCHOOL CAMERA CLUB—Brooklyn, N. Y. Established 1895. Headquarters, 75 Court Street, room 18 in School Building. Membership, 65; alumni membership, 55. Date of meetings, first and third Thursday ineach month. *President,* Richard Claggell. *Secretary,* Robert Redlefson, Manual Training High School. Exhibitions, Christmas vacation.

MEADVILLE CAMERA CLUB—Meadville, Pa. Established June, 1889. Meet at residence of members. Membership, 24. Date of meetings, last Friday of each month. *President,* P. B. Graham. *Secretary,* Miss Mary Brunett.

METROPOLITAN CAMERA CLUB—New York City. Established 1903. Incorporated 1904. Headquarters, 100-102 West 101 Street, New York. Membership, 150. Date of meetings, first Monday of each month. *President,* Curtis Bell, 558 Fifth Avenue. *Secretary,* S. C. Bullenkamp, 102 West 101st Street. Date of annual exhibition, December.

MINNEAPOLIS CAMERA CLUB—Minneapolis, Minn. Established 1892. Incorporated 1892. Headquarters, Public Library. Date of meetings, first and third Tuesday of each month, from September to May. *President,* H. E. Murdock, Commercial Building, Minneapolis, Minn. *Secretary,* C. J. Hibbard, 826 Hennepin Avenue.

MONTCLAIR CAMERA CLUB—Montclair, N. J. Established November 10, 1898. Incorporated August 5, 1899. Headquarters, Crane Biulding, 460 Bloomfield Avenue. Membership, 65. Date of meetings, 10th of each month. *President,* Dr. Morgan Wilcox Ayres, 155 Lorraine Avenue. *Secretary,* C. Russell Jacobus, 550 Bloomfield Avenue. Date of annual exhibition, next fall (date not fixed).

MONTREAL AMATEUR ATHLETIC ASSOCIATION CAMERA CLUB -Montreal, Canada. Headquarters, M. A. A. A. Building, 250 Peel Street. Organized May 1, 1906. Membership. 30. Meetings monthly. *President,* G. A. Melville. *Hon. Secretary-Treasurer,* C. F. G. Johnson, 250 Peel Street, Montreal.

NEWARK CAMERA CLUB—Newark, N. J. Established April, 1888. Headquarters, 222 Market Street, Newark, N. J. Membership, 60. Date of meetings, second and fourth Monday each month. *President,* Dr. E. Gunther, Newark, N. J. *Secretary,* W. S. Norris, 85 Bleecker Street, Newark, N. J.

NEW ENGLAND PHOTOGRAPHIC EXCHANGE MANAGING SOCIETY—Ogdensburg, N. Y. Headquarters, The St. Lawrence Camera Club. Membership Photographic Society of New Haven, Conn.; Providence Camera Club; Taunton, Mass., Camera Club; Manchester, N. H.. Camera Club; New Britain, Conn., Camera Club; Mystic Camera Club, Medford, Mass; Albany, N. Y., Camera Club; St. Lawrence Camera Club, Ogdensburg, N. Y. *Exchange Secretary,* John A. Brown, 26 Jay Street, Ogdensburg, N. Y., for the interchange of lantern slides and photographic prints.

ORANGE CAMERA CLUB—Orange, N. J. Established March 21, 1892. Incorporated May 19, 1893. Headquarters 222 Main Street, Orange. Membership, 97. Date of meetings, 5th and 20th of each month, except July and August. *President,* H. L. Cadmus. *Secretary,* Jos. L. Seiler, 222 Main Street, Orange, N. J. Date of annual exhibitions, fall and spring.

OREGON CAMERA CLUB—Portland, Ore. Established 1895. Incorporated 1903. Headquarters, 510 Macleay Building. Membership, 135. Date of meetings, second Tuesday in January. *President,* John Gill, care of Oregon Club. *Secretary,* Dana Steeth, 1025 Michigan Avenue. Date of annual exhibition, Thanksgiving week.

PENDLETON CAMERA CLUB—Pendleton, Ore. Established June 18, 1899. Headquarters, Association Block. Membership, 20. Date of meetings, every Tuesday. *President,* Lee Morehouse. *Secretary,* H. L. Hasbrouck, Pendleton, Ore.

PHOTOGRAPHIC CLUB OF BALTIMORE CITY—Baltimore, Md. Established 1885. Incorporated 1890. Headquarters, Club House, 870 Linden Avenue, Baltimore. Membership, active, 48; associate, 18; honorary, 10; non-resident, 2; total, 77. Date of meetings, every Tuesday, 8.15 P. M. *President,* Percy M. Reeves, 1201 North Charles Street, Baltimore. *Secretary* Julian A. Jenkel, 870 Linden Avenue, Baltimore. Date of annual exhibition, October

PITTSBURG ACADEMY OF SCIENCE AND ART OF PITTSBURG—Pittsburg, Pa. Organized January 23, 1900. Headquarters, Carnegie Institute, Shenley Park. Date of meetings, second and fourth Tuesdays of each month, except July and August. Membership, 100. *President,* W. A. Given. *Vice-President,* R. D. Bruce. *Treasurer-Director,* O. C. Reiter, *Secretary,* J. M. Connor, Shetland and Finley Avenues, Pittsburg.

PORTLAND CAMERA CLUB—Portland, Me. Established 1899. Headquarters, 571½ Congress Street. Membership, 90. Date of meetings, every Friday evening. *President,* S. S. Skolfield,. *Secretary,* O. P. T. Wish, 22 Sherman Street. Date of annual exhibition, in February.

PORTSMOUTH (VA.) CAMERA CLUB—Portsmouth, Va. Established 1898. Headquarters, 614 Crawford Street. *President,* Wm. Stertzbach, 208 High Street. *Secretary,* H. T. Richards, 614 Crawford Street.

PROVIDENCE CAMERA CLUB—Providence, R. I. Established 1883. Incorporated 1889. Headquarters, 128 Eddy Street. Total membership, 79. Date of meetings, fourth Wednesday every month. *President,* Charles Morrill. *Secretary,* Robert C. Lees, 128 Eddy Street, Providence, R. I.

QUEEN'S COUNTY CAMERA CLUB—Jamaica, L. I. Established July 1, 1901. Headquarters, Bernhard Court, Fulton Street. Membership, 49. Date of meetings, last Saturday of each month. *President,* Dr. H. Noble. *Secretary,* Henry D. Johnson, Jamaica, L. I. Annual exhibition in June.

ROSE TECHNICAL CAMERA CLUB—Terre Haute, Ind. Established 1897. Headquarters, Rose Polytechnical Institute. Membership, 35. Date of meetings, monthly. *President,* G. A. Kelsal, *Secretary,* B. M. Lindsley, Rose Polytechnical Institute.

RUTLEDGE CAMERA CLUB—Rutledge, Pa. Established June, 1900. Headquarters, room in Rutledge Institute. Date of meetings, second Friday in each month. *President,* J. H. Weeks. *Secretaary,* M. B. Wicks, Rutledge, Pa.

RUTLEDGE CAMERA CLUB—Rutledge, Pa. Established June, 1900. Headquarters, room in Rutledge Institute. Date of meetings, second Friday in each month. *President,* J. H. Weeks. *Secretary,* M. B. Wicks, Rutledge, Pa.

SAN DIEGO CAMERA CLUB—San Diego, Cal. Established May 12, 1900. Headquarters, San Diego Commercial College Rooms, 4th and C Streets. Membership, 5. Date of meetings, third and first Wednesday evenings. *President,* F. W. Kelsey. *Secretary,* Samuel Schiller, 1033 F Street.

SAVANNAH CAMERA CLUB—Savannah, Ga. Established June, 1897. Headquarters, Park Avenue and Bull Street. Membership, 46. Date of meetings, Wednesdays of each week. *President,* Ide B. Kops, 117 Bay Street, East. *Secretary,* L. M. Williams, National Bank Building, Savannah, Ga. Date of annual exhibition, Thanksgiving.

SUNNYSIDE CAMERA CLUB—St. Louis, Mo. Established October 10, 1891. Headquarters, 5902 S. Broadway (third floor). Membership, 21. Date of meetings, first and third Thursday in every month. *President,* Barthuld W. Blumenthal. *Secretary,* William A. Brichner, 4702 S. Compton Avenue. Exhibitions, annually.

SUNNYSIDE CAMERA CLUB—St. Louis, Mo. Established October 10, 1891. Headquarters, 5902 S. Broadway (third floor). Membership, 21. Date of meetings, first and third Thursday in every month. *President,* Barthuld W. Blumenthal. *Secretary,* William A. Brichner, 4702 S. Compton Avenue. Exhibitions, annually.

SYRACUSE CAMERA CLUB—Syracuse, N. Y. Established 1886. Incorporated January 19th, 1892. Headquarters, University Block. Membership, 101. Date of meetings, Friday evening of each week. *President,* J. E. Bierhardt, Western Union Tel. Co. *Secretary,* M. L. Trowbridge, 116 Ulster Street.

SYRACUSE CAMERA CLUB—Syracuse, N. Y. Establsihed 1886. Incorporated January 19th, 1892. Headquarters, University Block. Membership, 101. Date of meetings, Friday evening of each week. *President,* J. E. Bierhardt, Western Union Tel. Co. *Secretary,* M. L. Trowbridge, 116 Ulster Street.

TAUNTON CAMERA CLUB—Taunton, Mass. Established July 11, 1900. Headquarters, 2½ East Brittania Street. Membership, 25 active, 30 associate. Date of meetings, first Tuesday evening each month. *President,* Fred C. Whitehead. *Secretary,* William A. Bellamy, 34 Winter Street. The Club is a member of the New England Photographic Exchange.

THE ALBANY CAMERA CLUB—Albany, N. Y. Established October 21, 1887. Incorporated April 27, 1891. Headquarters, 29 Steuben Street. Membership, active, 34 associate, etc., 21. Date of meetings, first Friday in each month, July and August omitted. *President,* Augustus Pruyn, 230 State Street. *Secretary,* Leonard M. Wachter, 67 Walter Street. Date of annual exhibition, usually in January.

"THE CAMERA CLUB"—New York. Established by consolidation of Society of Amateur Photographers and New York Camera Club, in April, 1896. Incorporated May 7, 1896. Headquarters, 5 West 31st Street, New York. Membership, 225. Date of meeting, first Tuesday in April. *President,* F. Benedict Herzog, Ph.D., 51 West 24th Street, New York. *Secretary,* Monroe W. Tingley, 5 W. 31st Street, New York. Date of annual exhibition, annual members' show in April.

THE CAMERA CLUB OF THE TWENTY-THIRD STREET BRANCH Y. M. C. A—215 West 23rd Street, New York. Established June 3, 1904. Headquarters, 23rd Street, Y. M. C. A., New York City. Membership, 60. Date of meetings, first Monday each month, business; third Monday each month, social. *President,* William C. Eckman, 215 West 23rd Street, New York City. *Secretary,* Frank M. Ingalls, Room 914 23rd Street, Y. M. C. A., New York City. Date of annual exhibition, no fixed date.

THE CAMERA CLUB OF THE TWENTY-THIRD STREET BRANCH Y. M. C. A.—Established June 3, 1904. Headquarters, 23rd Street, Y. M. C. A., New York City. Membership, 87. Date of meetings, first Monday in each month, business meeting third Monday in each month, socials, lantern slide lectures, etc. *President,* John Fairman, 215 W. 23rd Street, Room 615 New York City. *Secretary,* Frank M. Ingalls, Room 914, 215 W. 23rd Street, New York City. Date of annual exhibition, (usually in January.) No fixed date.

THE CHICAGO PHOTOGRAPHIC SOCIETY—309, 134 VanBuren Street. Membership over 75. Meets every Friday. Annual meeting in January. *President,* Frank R. Howell. *Secretary,* Geo. C. Elmberger, 786 N. Fairfield Avenue, Chicago.

THE DENVER PHOTOGRAPHIC SOCIETY—Denver, Colo. Established October 26, 1891. Headquarters, Appel Building, 1230 Sixteenth Street. Membership, 91. Date of meetings, general, first Friday in each month; Board of Directors, last Friday in each month. *President,* Thomas E. Morgan. *Vice-President,* Capt. H. D. Smith. *Secretary,* George L. Beam. *Treasurer,* Charles S. Price. Annual exhibition, date set each year.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA—Philadelphia, Pa. Established November, 1862. Incorporated April 24, 1885. Headquarters, 1722 Arch Street. Membership, 175. Date of meetings, second, third and fourth Wednesdays, 8 P. M. *President,* C. Yarnall Abbott, 43 South 18th Street. *Secretary,* George Donehower, 902-1201 Chestnut Street. Date of annual exhibition, January.

THE POSTAL PHOTOGRAPHIC CLUB—Washington, D. C. Established December, 1888. Headquarters, Washington, D. C. Membership, 40. Date of meetings, no regular meeting. *President,* Charles E. Fairman, 1006 F Street, N. W. Washington, D. C. *Secretary,* Gustavus A. Brandt, 631 Maryland Avenue, S. W. Washington, D. C. Date of annual exhibition, albums circulate among members monthly, except August and September.

THE ST. LAWRENCE CAMERA CLUB—Ogdensburg, N. Y. Established 1900. Headquarters, 26 Jay Street, Ogdensburg, N. Y. Membership, 12. Date of meetings, at the call of the Secretary. *President,* Arthur L. Jameson, 50 State Street. *Secretary,* John N. Brown, 26 Jay Street.

THE TROY CAMERA CLUB—Troy, N. Y. Established February 22, 1904. Headquarters, Room 250 River Street. Membership, 121. Date of meetings, first Monday each month. *President,* William C. Roberts. *Secretary,* Albert A. MacNaughton, P. O. Box 58, Troy, N. Y.

TORONTO CAMERA CLUB—Toronto, Can. Established 1887. Incorporated 1893. Headquarters, Forum Building, Yonge Street, Toronto, Can. Membership, 180. Date of meetings, every Monday, from October to April inclusive. *President,* John Manghan, Jr., 98 Wellington Place. *Secretary-Treasurer,* Hugh Neilson, 295 Carlton Street. Date of annual exhibition, March or April.

TOWN AND COUNTRY CLUB—Minneapolis, Minn. Established 1901. Date of meetings, every week, at which lectures are given pertaining to camera work. *President,* George L. Nevins. *Secretary,* Melvin W. Wright. Exhibition annually.

TRENTON PHOTOGRAPHIC SOCIETY—Trenton, N. J. Established January 7, 1898. Incorporated April 30, 1898. Headquarters, 132 East State Street. Membership, 47. Date of meetings, second Monday evening in each month. *President,* John S. Neary, 10 West Front Street. *Secretary,* Edgar D. Coleman, 143 Mercer Street. Date of annual exhibition, no date set.

VALLEY CAMERA CLUB—Phenix, R. I. Established April, 1896. Headquarters, Phenix, Rhode Island. Membership, 45. Date of meetings. alternate Mondays. *President,* Ward E. Smith, Phenix, R. I. *Secretary,* J. Bancroft Lawton, Phenix, R. I., Box 43. Date of annual exhibition, June.

WALLINGFORD CAMERA CLUB—Wallingford, Conn. Established 1897. Headquarters, Academy Street. Membership, 27. Date of meetings, third Monday every month. *President,* Lothar Baron von Grave. *Secretary,* F. L. Lathrop, 490 North Main Street, Wallingford, Conn. Exhibition, December.

WASHINGTON CAMERA CLUB—Tacoma, Wash. Established and incorporated May, 1900. Headquarters, Ferry Museum. Membership, 40. Date of meetings, first Wednesday each month. *President,* Charles Bedford. *Secretary,* W. H. Orilstrap, Ferry Museum, Tacoma, Wash.

Y. M. C. A. CAMERA CLUB—Denver, Col. Established September, 1899. Headquarters, Y. M. C. A. Membership, 30 Date of meetings, last Friday each month. *President,* Irving W. Laninae, Y. M. C. A., Denver. *Secretary,* Henry Huntington, MacPhee Building, Denver. Date of annual exhibition, first week in December.

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LIST OF THE COUNTRIES WITH WHICH THE UNITED STATES HAVE ESTABLISHED COPYRIGHT RELATIONS.

July 1, 1891.—Belgium, France, Great Britain and her possessions, and Switzerland.
April 15, 1892.—Germany.
October 31, 1892.—Italy.
May 8, 1893.—Denmark.
July 20, 1893.—Portugal.
July 10, 1895.—Spain.
February 27, 1896.—Mexico.
May 25, 1896.—Chile.
October 19, 1899.—Costa Rica.
November 20, 1899.—Netherlands (Holland) and her possessions.

Table Showing Displacement on Ground Glass of Objects in Motion.

By HENRY L. TOLMAN.

[Republished, with corrections, from the *Photographic Times*.]

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Miles per Hour.	Feet per Second.	Distance on Ground Glass, in inches, with Object 30 Feet away.	Same with Object 60 Feet away.	Same with Object 120 Feet away.
1	1½	.29	.15	.073
2	3	.59	.29	.147
3	4½	.88	.44	.220
4	6	1.17	.59	.293
5	7½	1.47	.73	.367
6	9	1.76	.88	.440
7	10½	2.05	1.03	.513
8	12	2.35	1.17	.587
9	13	2.64	1.32	.660
10	14½	2.93	1.47	.733
11	16	3.23	1.61	.807
12	17½	3.52	1.76	.880
13	19	3.81	1.91	.953
14	20½	4.11	2.05	1.027
15	22	4.40	2.20	1.100
20	29	5.87	2.93	1.467
25	37	7.33	3.67	1.833
30	44	8.80	4.40	2.200
35	51	10.27	5.13	2.567
40	59	11.73	5.97	2.933

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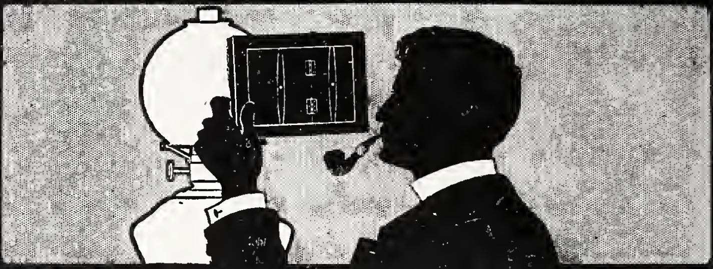

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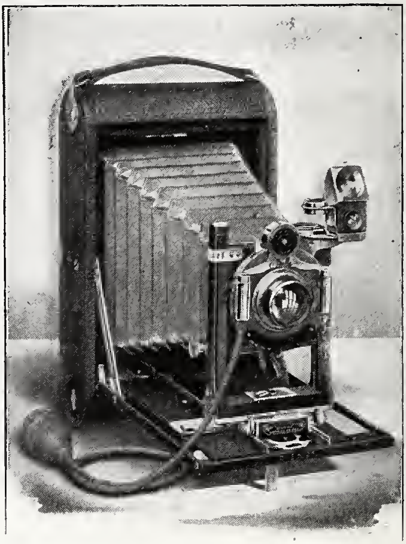

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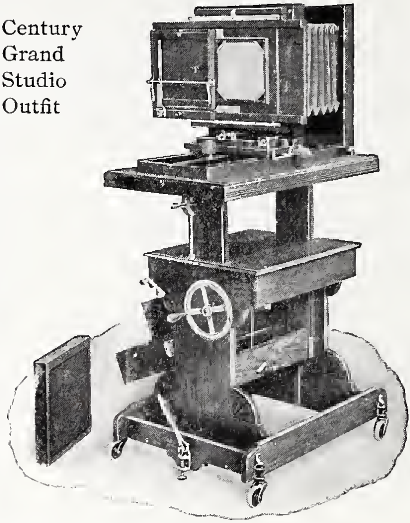

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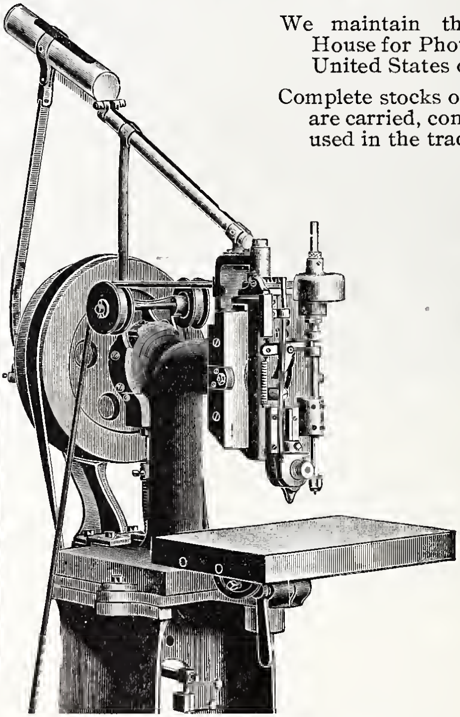

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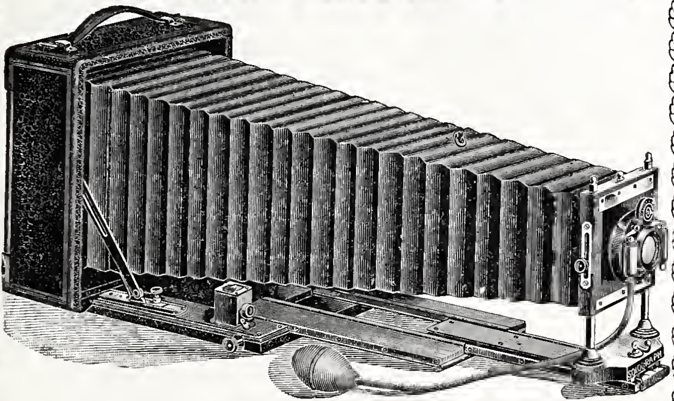

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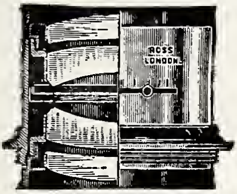

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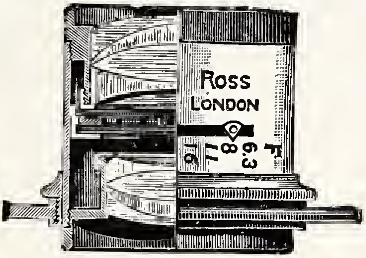

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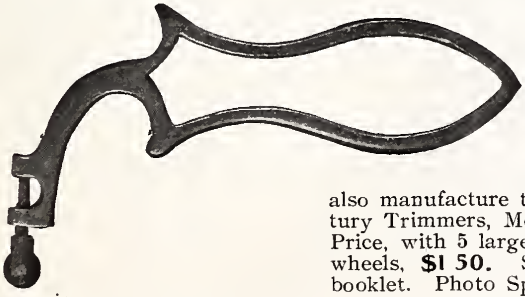

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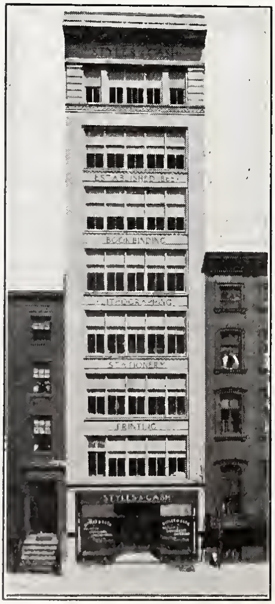

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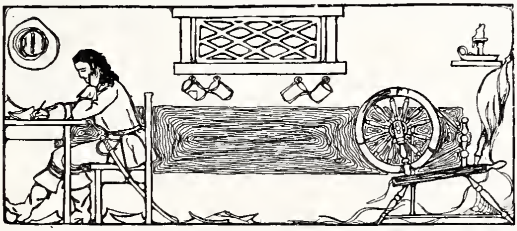

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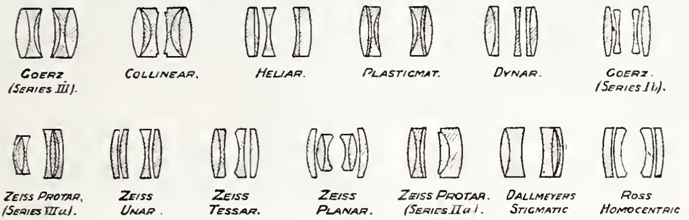

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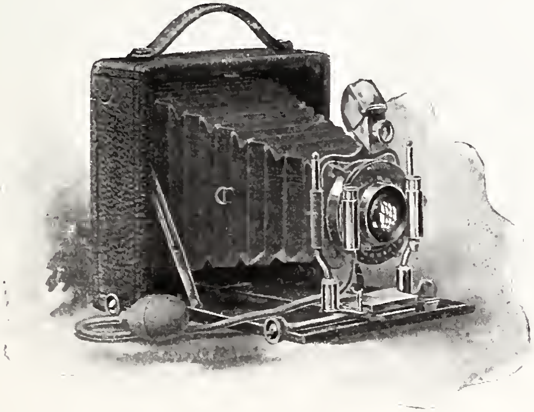

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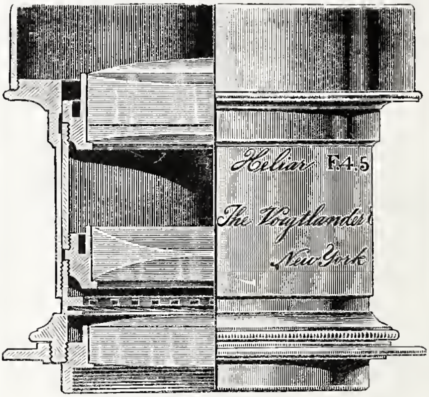

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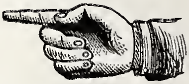

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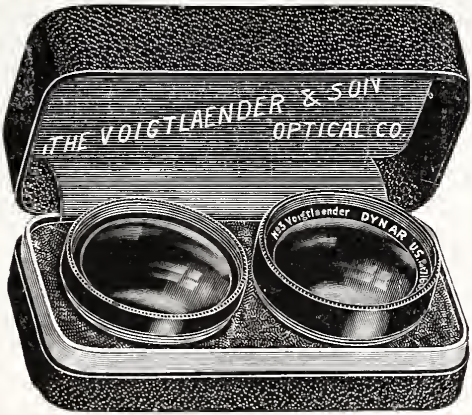
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